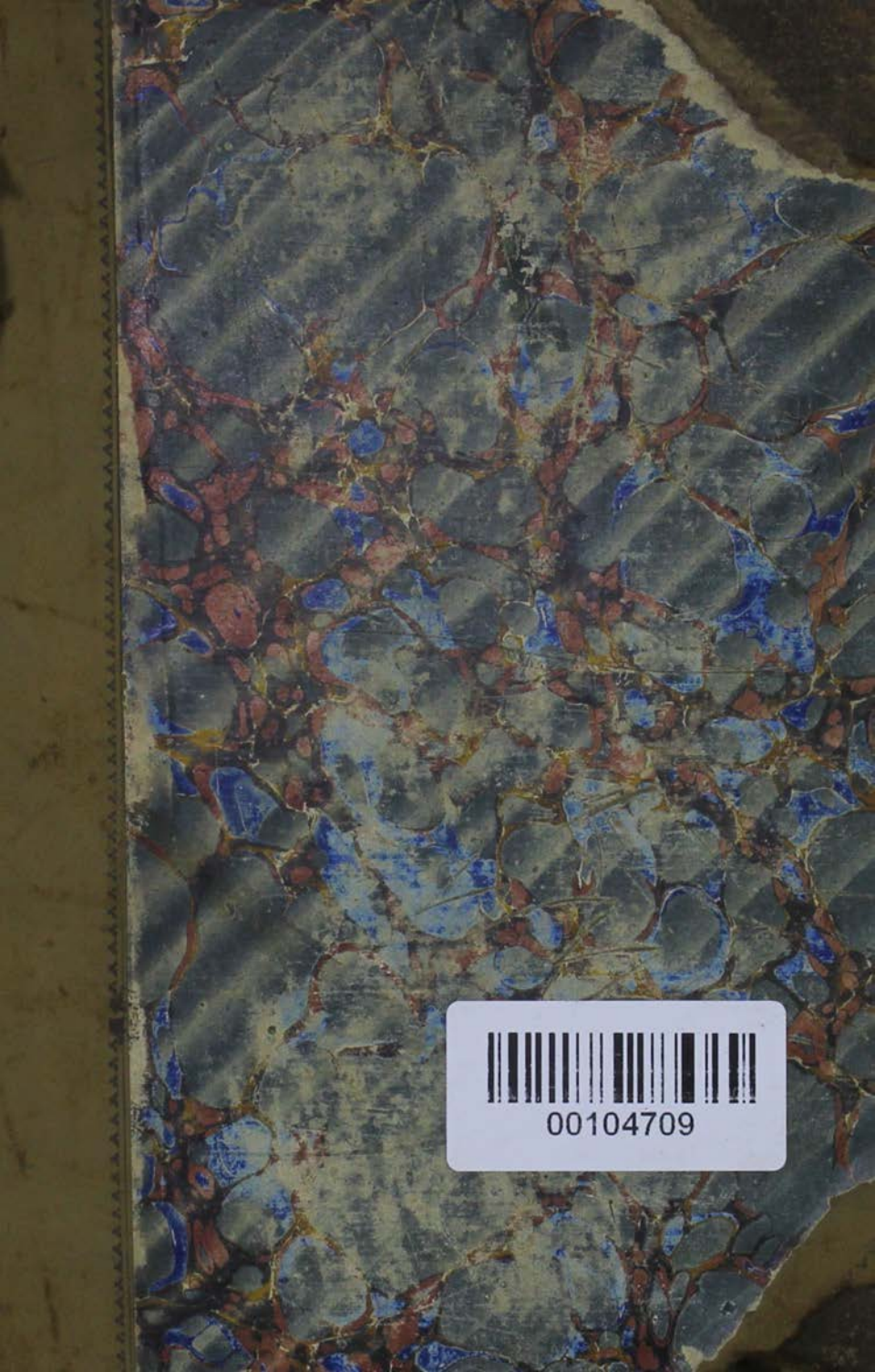
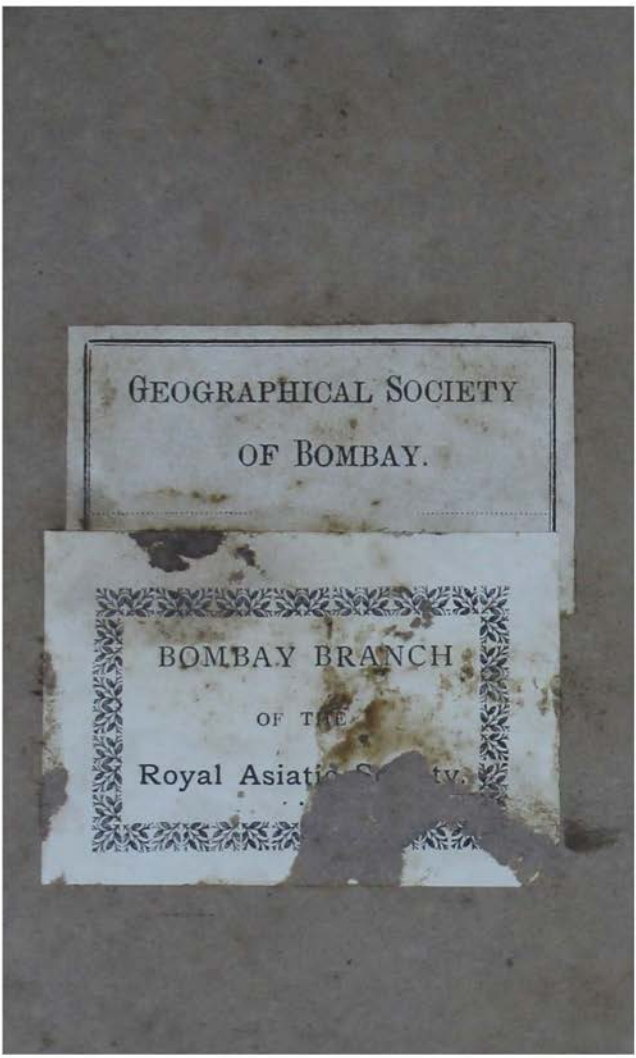

00104709



Digitized with financial assistance from the
Government of Maharashtra
on 05 October, 2018

THE

DANISH PILOT.

BY

VICE-ADMIRAL ZAHRTMANN,

GRAND CROSS OF DANNEBROGE, KNIGHT-COMMANDER OF THE RUSSIAN ORDER OF ST. ANNE, THE SWEDISH SWORD, THE PRUSSIAN RED EAGLE, AND THE GREEK SAVIOUR, AND DIRECTOR OF THE HYDROGRAPHIC OFFICE AT COPENHAGEN.

104709 ac

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

LIBR
OF TH
BOMB
BRANC
OF THE
ROYAL ASIATIC

LONDON:
PRINTED FOR THE HYDROGRAPHIC OFFICE, ADMIR
AND SOLD BY
J. D. POTTER, *Agent for the Admiralty Charts*, 31 POULTRY,
AND 11, KING STREET, TOWER HILL.
1853.

Price Four Shillings and Sixpence.

GG. 4. 4

God
914.8904
Bar
104709

LONDON: PRINTED BY WILLIAM CLOWES AND SONS, STAMFORD STREET,
For Her Majesty's Stationery Office.

ADVERTISEMENT.

THE following Sailing Directions for the Danish Waters were drawn up by the late Admiral Zahrtmann, and have gone through two editions in Denmark. His great experience, high character, and splendid talents, give them indisputable authority among Baltic Seamen; and English Navigators will, no doubt, receive them with equal confidence when it is known that they were translated into English by his own accomplished pen.

While the last sheet was in the press, the whole edition was consumed by the fatal fire that destroyed Messrs. CLOWES' magnificent Printing Establishment; but that misfortune, though greatly delaying its appearance, was yet attended with the signal advantages of its thorough revision by the author, a few months previous to his lamented death, along with the insertion of the additional matter found in his second edition, as well as of the final Chapter on the Navigation between the Texel and the coast of Denmark.

F. B.

August the 2nd, 1853.

ADDENDA.

THE following official notices were issued while this work was passing through the press:—

Lister Deep. (Arts. 1011, 1015, and 1016.) "On the north side of the Solt Sand Shoal, another black buoy is to be placed; there will then be two black buoys on this shoal, marked List No. 1 and No. 2. The white buoy A. is to be placed further to the N.W. in 14 feet, at the S.W. end of the Rist Shoal."

(Art. 1016.) "The following additions and alterations in the buoyage of this channel are also to be shortly made. Instead of the usual buoy at the entrance of the channel, a Placocks buoy with a vane, will be substituted, marked Lister Deep: this kind of sea-mark appears like a floating-beacon, rises 12 feet above the water, and is intended to serve as a refuge for 12 persons."

(Art. 1019.) "Instead of the red buoy a white and black striped buoy, 5 feet long, is likewise to be immediately placed on the north spit of the Hunning Shoal, which, on entering the Hoyer Channel, must be kept to starboard, or if the channel to List Roads to port."

New Hever Strom. (Art. 1050.) "Between the white buoys C. and D., another white buoy, but without any letter, will be placed on the projecting point of the north Sand Ground; and the green wreck-buoy will be taken away."

North Elbe. (Art. 1100.) "For the white buoy A. there will be substituted a 13-feet white water-ballast buoy with a black ball."

(Art. 1100.) "The floating beacon on Gehlsand flat is to be taken away."

"Board of Inspection for the Lights and Buoys on the West Coast of Denmark. May 2, 1853.

A. C. HAMMER."

Submarine Telegraphic Wires.

"It is hereby made known that Submarine Telegraphic Wires have been laid down both in the Great and Little Belts, bearing the following marks, to wit:—In the Great Belt, two marks erected on Knuds Highland for the line from thence to Sprogö Vesterrev (West Reef) bearing W. ¼ S., and E. ¼ N. from each other, and two marks on the Siæland side bearing W. ¼ N. and E. ¼ S. apart, for the line over the east end. South of Sprogö, beacons are erected to show the direction of the wires at that spot. In the Little Belt two marks are erected east of Striib, bearing N. by W. ¼ W. and S. by E. ¼ E. of each other. All those marks consist of wooden buoys, painted white and easily discernible, which, by their position, show the line of the wire. As any anchoring over this wire might cause considerable inconvenience alike to the public, by means of the Telegraph being brought out of order, and to every ship or vessel anchoring on the line, by which they run the risk of not getting their anchor home, or breaking their anchor-chains or cables, all navigators passing the Great or Little Belt are prohibited to anchor in the above-named marks; and they are enjoined by their own vigilance to prevent this, or by implicit obedience to any warnings they may receive relative thereto, either from the inspector thereof, or from the watch-ship in the Great Belt, the light and beacon inspector, pilots, ferrymen, coast-guard, or whatsoever other authorities may be vested with the necessary power and instructions.

"Marine Ministry, Copenhagen, May 14, 1853.
STEEN BILLE, Danish Consulate-General.
London, May 31, 1853."

From Shipping Gazette of June 2, 1853.

CONTENTS.

CHAPTER I.

KATTEGAT.

	Page
Currents and Ice	1
Entering the Kattegat along the Swedish shore	6
Marstrand Fiord	8
Kalö Fiord; Ockerö Sound	11
Dana Fiord; Vinga Sound; Rifö Fiord	12
Askim Fiord	17
Kongsbacka Fiord	20
Kloster Fiord	22
Laholm or Halmstad Bay	26
Skelder or Engelholm Bay	29

CHAPTER II.

EAST COAST OF JUTLAND, FROM THE SKAGEN TO THE LITTLE BELT.

Skagen (or Scaw) Village and Light	31
Aalbek Bay	32
Hirtsholm and Grassholm Islands	33
Frederikshavn Harbour and Light	37
Sæby Flat; Dvale Ground	38
Læsö Channel	40
Liim Fiord	42
Mariager Fiord; Randers Fiord	47
Tangen Bank; Stauns Head	50
Hielm Island	56
Ebeltofte Bay; Alhagen Shoal	58
Begtrup and Kalö Bays	59
Aaarhuus Bay	61
Norsminde Flat	64
Thunö Island	66
Svane Ground; Samsö Channel	69
Endelave Island and Shoals	70
Horsens Fiord; Sönder Ground	71
Samsö Island	73
Kyholm Islands and Channels	75
Mosel and Munke Grounds	82
North entrance to the Great Belt; Seierö Deep	83

CHAPTER III.

NORTHERN SHORES OF FYEN AND SIÆLLAND ISLANDS, FROM ÆBELÖ TO GILBIERG HEAD.

	Page
Æbelö Island Anchorages	85
Odense Fiord	86
Nexelö	91
Seierö Island and Reefs	92
Schultz Ground and Channel	97
Ise Fiord	99
Spotsbierg to Gilbierg Head	109

CHAPTER IV.

ISLANDS AND SHOALS IN THE KATTEGAT.

Læsö Island and Shoals	110
Trindelen Shoal and Light	112
Shoals on the east side of Læsö	114
Læsö Channel and Light	120
Bank connecting Læsö and Anholt	124
Anholt Island and Shoals	125
Hesselö Island and Light	129
Banks in the Eastern Channel of the Kattegat	130

CHAPTER V.

THE SOUND.

Limits of the Sound	133
Pilots; Currents and Tides	134
From the Kullen to Kronborg	136
Höganæs Road; Jungnæs Rocks	138
Helsingborg	140
Danish shore, Gilbierg Head to Kronborg	141
Turning Marks on the Swedish shore	145
Turning Marks on the Danish shore	147
Directions for entering the Sound	148
Elsinore	151
Hveen Island	157
Swedish shore between Helsingborg and Landskrona	158
Channel between the Danish shore and Hveen Island	160
Channels to Copenhagen	161
Konge Deep and Drogden Channel	164
Saltholm Shoals	173

CHAPTER VI.

FLINT CHANNEL.

	Page
Swedish shore between Landskrona and the Flint Channel	178
Shoals between Saltholm and Malmö	181
Directions for the Flint Channel	182
Falsterbo Point, Reef, and Lights	187
Eastern shore of Siælland; Kioge Bay	189
Kallebo Inlet	190
South-east shore of Siælland; Faxö Bay	193
North shore of Möen	199
Bögeström and Ulfshale Channels	200
South Shore of Möen; Hielm Bight	202

CHAPTER VII.

GREAT BELT.

West Coast of Siælland; Jammerland Bay	206
Shoals between Hindsholm and Siælland	208
Muusholm Island and Bay	209
Eastern shore of Fyen; Kierteminde Bay	213
Nyborg Fiord	214
Sprogö Island and Shoals	218
Langeland Belt	219
South shore of Fyen	224
Thorö Island; Svendborg Sound	224
Western shore of Langeland	225
South-western shore of Siælland	231
Islands and Shoals on the S.W. shore of Laaland	238
Eastern shore of Langeland	241

CHAPTER VIII.

THE EASTERN CHANNELS BETWEEN THE GREAT BELT AND THE BALTIC.

South coast of Siælland	243
Islands off the north side of Laaland	246
Askö, Lilleö, and Feiö	250
Guldborg Sound	257
Directions through the Stor Ström to Nyord and the Bogeström	261

CHAPTER IX.

LITTLE BELT.

	Page
Limits of the Little Belt	270
North shore of Fyen	270
East coast of Jutland; Veile Fiord	273
Narrows of the Belt	274
Kolding Fiord	278
Slesvig shore; Mos Vig	282
Brandsö Island and Reefs	283
Baagö Island and Flat	290
Aarö Island and Shallows	292
Channels between Aarö and Baagö	294
Gienner Fiord	297
South side of Als Island	300
Shoals between Als and Fyen	303
South shore of Fyen	304
Svendborg Sound	313
Erö Island	317
Dreiö and Hiortö Islands and Shallows	320

CHAPTER X.

LITTLE BELT TO THE BALTIC.

Kiel Bay; Flensborg Fiord	323
Sli Fiord to Slesvig	336
Eckernförde Bay	338
Kiel Fiord	341
Holstein shore; Hohwacht Bay	343
Femern Sound	347
Neustadt Bay	350
Wismar Bay	353
Mecklenburg Coast; Warnemunde	361

CHAPTER XI.

SOUTH SHORE OF LAALAND.

Marstal Bay	363
Femern Belt	364
Rödby	365
Nysted and Shoals	367
Giedser Reefs	371
Grön Sound, Eastern entrance	376

CHAPTER XII.

BORNHOLM AND THE ERTHOLMS.

	Page
Bornholm Light; Rönne Harbour	379
Shoals off the South Shore of Bornholm	381
Nexö Road	383
Ertholms or Christiansö	385

CHAPTER XIII.

FROM THE SKAGEN OR SCAW TO THE HORN REEFS.

Description of the Coast	388
Currents and Tides	389
Hirtshals Point and Flat	390
Tannis and Jammer Bays	392
Hanstholm Light	393
Agger Minde, the entrance to Liim Fiord	395
Nissum Fiord; Nyminde Gab	419
Ringkiöbing Fiord	421
Horn Reefs	422

CHAPTER XIV.

FROM THE HORN REEFS TO THE ELBE.

Description of the Coast,—Buoys and Beacons	426
Tides	427
Fanö Island and Channels	429
Manö Island and Shoals	435
Romö and Sylt Islands	437
Lister Deep	437
Inlets between Sylt and Amrum	443
——— Föhr and Pelworm	449
Old Hever Ström	457
New Hever Ström	461
Inner Channels between Fanö and Eiderstedt	468
River Eider	473
Anchorages in the Eider	486
Inner passages between the Eider and the Elbe	489

CHAPTER XV.

RIVER ELBE.

	Page
Helgoland Island	491
Soundings off the Elbe	493
Directions for entering the Elbe by day	497
——— by night	499
Cuxhaven	501
Gluckstadt	508
Regulations for Steam Vessels	511
Altona Harbour and Railway Pier	512
Hamburg; Stecknitz Canal	513
Tide Table for the West Coast of Denmark	514

CHAPTER XVI.

FROM THE TEXEL TO THE WESER.

General Remarks	515
Directions for making the Texel	516
Entrance to the Vlie Stroom	519
——— Ameland Gat	521
Ems River	523
Directions for making the Ems	524
Islands and Inlets between the Ems and the Jahde	525
Weser River	527
Directions for making the Weser	529

ERRATA.

Pages 87 and 89, top of each page, *for* NORTH SHORE OF SIÆLLAND *read* NORTH SHORE OF FYEN.
„ 241, foot note, *for* Kiol Bay *read* Kiel Bay.
„ 259 ——— Article 858 *read* Article 860.
„ 282, top of the page, *for* LITTIE BELT *read* LITTLE BELT.
„ 312, line 4 from top, *for* Skaaö *read* Skaarö.
„ 399, line 13 from bottom, *for* Mors *read* Mors or Morsö.

GLOSSARY OF TERMS

USED IN THE ORIGINAL WORK.

Aae, Aue . . . . . Rivulet
Aas . . . . . Hill
Baake . . . . . Beacon (ashore)
Bakke . . . . . Hill
Bek, Bæk . . . . . Rivulet
Berg, Bierg . . . . . Mount, Hill
Boe, Boen. . . . Detached rock, rocks
Borg . . . . . Castle, or Mansion
Bugt . . . . . Bight, or Bay
Bye, or By . . . . . Town
Dorf, Turf, Torp, Tofte . . . Village
Dyne. . . . . A Down
Dyb, Dybet . . . . . A Deep
Fiord. . . Frith, or long narrow Inlet
Flak . . . . . A Flat
Gab . . . . . Open Bay
Gat . . . . . Inlet, Narrow Pass
Grund . . . . . Ground
Hage. . . Strip or Hook of Low Land
Hals . . . . Strip or Neck of Land
Havn . . . . . Haven, Harbour
Höi . . . . . Height
Holm . . . . . Island
Hoved . . . . . Head
Huk . . . . . Hook
Inder . . . . . Inner
Kalv . . . . . Detached small islet
Kirke . . . . . Church
Knob . . . . . Knob
Knude. . . . . Bluff
Ley . . . . Inlet, or Small Passage
Lock . . . . . Inlet
Lods, Loots . . . . . Pilots
Löb . . . . . Channel, Passage
Lys . . . . . Light (colour)
Merke . . . . . Mark
Mellem. . . . . Middle, Between
Münde . . . . . Mouth
Næs, Nes . . . . . Ness, Cape
Noer, Nöer. . . Small Harbour or Basin
Odde . . . . . Point
Oe, Ö, Öe . . . . . Island
Ore . . . . . Ear
Pult . . . . (Trunk) small Shoal
Rende . . . . . Channel
Rev. . . . . Reef
Revle . . . . . Bar
Rhed, Red. . . . . Roadstead
Rys, Rös, Rösse . . . Rocky Ground
Rön, Rönne. . Detached separate Rocks
Rönne . . . . . Small Hut
Skær, Skjær . . . . Rocky Danger
Skov . . . . . Wood, or Forest
Slik. . . . . Sleek, or Oaze
Slot. . . . . Palace, Castle
Stad, Stadt . . . . . City
Stak . . . . . Heap, Stack
Steen . . . . . Stone, or Rock
Stiert . . . . . Tail, or Spit
Sund . . . . . Sound
Taarn . . . . . Tower
Tånge, Tunge . Tongue, Strip of Land
Tofte, Torf, Torp, Dorf . . . Village
Trup . . . Small cluster of Houses
Tönde . . . . . Buoy, Cask
Vager . . . . . Beacon (afloat)
Val, Vallen . . . . . Shore, Shores
Varde . . . . Beacon (ashore)
Vig. . . . . Bay
Vrag . . . . . Wreck
Wik, Wikken. . . . . Bay, Bays
Yder . . . . . Outer

GLOSSARY OF A FEW WORDS

WHICH MAY BE USEFUL IN QUESTIONING THE PILOTS.

Agter	Aft
Agterstevn	Stern
Anker	Anchor
Anker flig	Anchor flukes
Baad	Boat
Bagbord	Larboard or Port
Bak Seil	Aback, all aback
Bestik	Dead reckoning
Bierge Seil	Shorten Sail
Bram Stang	Top-gallant Mast
Bram Seil	Top-gallant Sail
Brase bak	Brace aback
Bugsere	To Tow
Byge	Squall
Den anden boug	About
Dræg	Grapnel
Dybgaaende	Draught of Ship
Ebb	Ebb Tide
Favne	Fathom
Flod	Flood Tide
Flig	Flukes
Fod	Foot, Feet
Fokke Mast	Fore Mast
Fokken	Fore Sail
Fortöie	Moor
Forude	Ahead
Friske-i-Klydset	Freshen the cable
Fuld-og-bi	Full and by
Fyr-skib	Light-vessel
Fyr-taarn	Lighthouse
Gangspil, spil	Capstan
Giv op	Clew up
Haand-lod	Hand-lead
Ilæ	Leeward
Jager	Flying jib
Kabellaring	Messenger
Kiede, Kjetting	Chain
Klyds	Hawsehole
Klyver	Jib
Kovende, or Vende for Vinden	Wear ship
Krydse	Beating, or turning to windward
Lager val	Lee shore
Lette det ene	Unmoor
Ligge back	Lie to
Luf	Luff
Misan Mast	Mizen Mast
Nathuset	Binnacle
Paa ground	Aground
Pal	Pawl
Peiling	Bearing
Rat	Wheel
Ratline	Tiller ropes
Rebe	Reef (sails)
Sakning	Sternboard
Skiærpe	Brace up
Skrog	Hull
Stag	Stays
Stevn	Stem
Stor Mast	Main Mast
Stor Seil	Main Sail
Ström	Current, Stream of Tide
Strömrase	Race (ripple)
Styrbord	Starboard
Tallie	Tackle
Til veirs	Aloft
Tommer	Inches
Uklar	Foul
Varpe	Warp
Varp Anker	Stream Anchor
Vende	Tack
Vende for Vinden, or Kovende	Wear Ship
Vind	Wind

PRONUNCIATION OF THE DANISH OR SWEDISH VOWELS.

A, a, is pronounced as *a* in the English word, class or palm.

AA, aa, å,	,,	*aw*	,,	fall.
Æ, æ, ä	,,	*a*	,,	fate.
e	,,	*e*	,,	they.
i	,,	*i*	,,	bill.
O, o	,,	*o*	,,	no.
Ö, ö	,,	nearly as *oo*	,,	loose.
	,, exactly as *œu* in the French word, cœur.			
u	,,	as *u* in the English word, bull.		
ü, y	,,	as *u*	,,	flute.

IN THIS WORK THE BEARINGS ARE ALL MAGNETIC, EXCEPT WHERE MARKED AS TRUE.

THE DISTANCES ARE EXPRESSED IN SEA MILES OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS SUPPOSED TO BE EQUAL TO 100 FATHOMS.

THE

DANISH PILOT.

CHAPTER I.

THE KATTEGAT.

1. For the convenience of geographers, and to prevent disputes in matters of insurance, the boundaries of that portion of the sea, called by all seafaring nations by its original Dutch name, the Kattegat, shall be first stated. To the northward, a line from the point of the Skagen (or Scaw) to the inlet of Uddewalla, leaving the Paternosters on the outside and including Marstrand in the Kattegat. To the south-eastward, a line from the Kullen, a rocky promontory on the Swedish coast, to Gilbierghoved (Gilbierg Head), on the Danish island of Siælland (Sealand). And again, towards the Belts, a line from Gniben Point, the extremity of the north-west peninsula of Siælland, to Hasenöre, a low point on the coast of Jutland. *Boundaries.*

2. The greatest danger in navigating the Kattegat arises from the irregularity of the current; of course a regular tide does exist, but its influence is so small, even at the entrance of the Kattegat and in the vicinities of the Skagen, Frederikshavn, and Hals, that the difference between high and low water only amounts to one foot, and farther in still less; but towards the Sound and the Belts it again increases, owing to the narrow channels of the Little Belt, Svendborg Sound, Grön Sound, &c. In the Baltic it is quite imperceptible, for that inclosed sea, being fed by numerous rivers, has a natural tendency to expand its waters into the North Sea; and moreover, the configuration of the land is such, that most winds force the water out from the Baltic through the Belts, the Sound, and the Kattegat, while, on the contrary, a few winds only impel the *Currents.*

North Sea in through the Kattegat. It is fully proved by experience, that the current is chiefly directed by the wind, though not always by that which is or has been recently blowing, but frequently by the wind that is coming, or even by gales which are prevailing at a great distance.

Wind acts upon the Current.

3. This influence of the wind on the current entirely overcomes the effects of the tide, and occasions several irregularities: for instance, north-easterly and westerly winds frequently occasion a current from the southward; and as all other winds from N.E. round by E. and S. produce also a northerly current, it may be stated as a fact, that a current setting to the northward prevails five-sevenths of the year, while a current in the contrary direction prevails only two-sevenths of the year.

4. This proportion, however, varies according to the different seasons; thus, the northerly current prevails in December and January over the southerly current in the proportion of seven to two, while this ratio in June, August, and November is only as six to three. But it ought to be remarked, that the above proportions principally obtain in the broader parts of the Sound, and that the supremacy of the northerly run of the water is somewhat less in the Kattegat, and diminishes still more in its northern parts.

Current in the Narrows.

5. In the narrows of the Sound the current is so rapid and peculiar, that it will require a closer explanation. Hitherto we have only mentioned the principal deviations of the current from its general direction, but the numerous islands and shoals produce many other irregularities, and contrary currents on the surface or beneath it, in the narrows, and in the eddies along the shores, so that they run in opposite directions until the one or the other prevails, and thus occasion ripplings on the water.

Ripplings.

These ripplings are generally in a N.E. and S.W. direction, though sometimes E. and W.; in which case the set to the northward will be found on the east and south sides of the rippling, while the contrary takes place on its opposite borders, and attention must be paid to this feature in beating to windward. If the northerly current gets the mastery, it is most frequently only near the surface, while the contrary current runs beneath, and often with a greater velocity than that above, which is, perhaps, partly owing to the pressure of the atmosphere, and partly to the evacuation of the waters of the Baltic.

6. Besides these, there are many other irregularities in the current: many of them are occasioned by Læsö Island with its surrounding banks and shoals, as well by its extent and position; for it is a well-known fact that the current abreast thereof frequently sets directly towards the coast of Sweden, and then along shore to the northward with increased velocity, until past Marstrand, and into the Bay of Bohus; and that by its direction and velocity it is even possible with tolerable certainty to prognosticate a change of wind. The principal cause of this set of the current towards the Swedish coast, and along it to the northward, may be traced to the circular movement of the current in the Sleeve or Skagerak. From the abundance of mountain rivers in Norway which pour their waters through the different large fiords into the Sleeve, the current along the coast of Norway generally runs to the south-westward, and thereby forces the tide coming from the North Sea into an opposite direction towards the coast of Jutland; where generally, in moderate weather, it sets in an E.N.E. direction, though gales of winds from N. and E. change its course to W.S.W. When this current passes the Skagen it meets with that which runs to the northward out of the Kattegat; they of course unite, and taking a north-easterly direction in the Sleeve, run right over to the Swedish coast, where, reinforced by the water coming from the frith or fiord of Christiana, they follow the trend of the coast, or take a W.S.W. direction.

Currents off Læsö,

in the Sleeve, or Skagerak,

off Jutland,

7. It sometimes happens, however, that the current running in to the southward from the North Sea, does not meet that which sets to the northward through the Kattegat, until abreast of the Trindelen; and in this narrow part of the Kattegat, even in fine weather, it is occasionally met by a most violent current.

off Trindelen.

8. The influence of the wind on the strength of the current often extends to a considerable distance, so that although its usual rate does not exceed 1½ miles per hour, yet in certain places and circumstances it attains to the rate of 4 or 5 knots.

Rate of Current.

9. It is not probable that the Kattegat was ever entirely frozen across, nor is there any evidence that even Læsö has been joined by ice to the opposite coasts; but drift ice is every year common in the Kattegat, in a larger or smaller quantity. Part of this ice is formed in the Kattegat itself, but by far the greatest part comes from the Baltic and finds its way principally through the

Ice.

Drift Ice.

Great Belt, where it is broken to pieces and packed together in smaller heaps. These indeed, in calm frosty weather, may again freeze together and form considerable masses, but the ice has then lost that cutting power which is so dangerous to shipping, and so frequent in the interior of the Baltic. In the Kattegat it may happen that ships are thrown on the shore by the force of the ice, but they are not cut through, nor even are their cables, and this is still less likely to happen in future, as chains have been so generally substituted for hemp cables. Ships provided with good anchors and chains have not therefore much to fear from the effects of the ice, where they are able to find a good holding ground, especially in the northern parts of the Kattegat; and in this respect the passage to the westward of the islands Anholt and Læsö is to be preferred from its having less water, though the drift ice may be in greater quantity than in the eastern channel. In proof of these remarks, a man-of-war brig that was riding by one of her bower anchors in the roadstead of Fladstrand at Frederikshavn was swept adrift by a large mass of ice, of such extent that its end could not be seen from the crosstress, and yet brought up in safety by letting go her other bower, which, though weighing 1300 lbs., for some moments remained on the solid ice before it broke through and took hold; and moreover, it was afterwards ascertained that not a single yarn of the cable had been cut.

Drift Ice appears about Christmas.

The drift ice rarely commences in the Kattegat before the new year, and scarcely ever before Christmas; but the period for its ceasing cannot be foreseen, as that depends entirely on the state of the ice in the Baltic, where it has been known to remain fixed and passable between Bornholm and Sweden so late as up to the time of the vernal equinox. Accordingly drift ice may be met with in the Kattegat even in April, and is common in March, though generally it ceases in February, after which time, though of some inconvenience to navigation, it seldom puts a stop to it entirely.

Signal for Drift Ice.

As long as drift ice is to be seen from the lighthouse on the Skagen point, a white flag with a vertical blue stripe is hoisted there.

Ground Ice.

10. It frequently happens that large masses of ice, which may be said to screw themselves up on different parts of the coast, or which hang on the ground in shoal water, remain for some time after the channels are clear. The shoals and sandbanks may thereby

undergo some change, but this seldom happens where the depth of water exceeds 7 or 8 feet, or when the shoal is of a small extent. The ice is never piled up on the small shoal called the Trindelen, although it may fasten around it. The ice forms soonest at low-water and with a N.E. breeze, and, on the contrary, it breaks away and disperses the quickest with a southerly wind, accompanied by a current to the northward, or by a N.W. gale at the time of high-water.

Approach to the Kattegat, by the Lights, by Soundings.

11. It is by no means difficult to make the Kattegat, when due attention is paid to the lights on the Skagen or on Marstrand, for the first being fixed and the other revolving, a mistake is impossible. These lights, with others on the coasts of Norway and Sweden, afford good leading marks to the Kattegat, and additional lights are now preparing; but it frequently happens that foul and hazy weather prevents the mariner from seeing them, or any part of the coast, and in this case his only guide will be the soundings, to carry him round the point and reef of the Skagen, or Skaw. Due attention must then be paid to the gradual shoaling of the water towards the coast of Jutland, where good soundings may be had 15 or 20 miles off shore, but this is not the case farther out, in 80 to 100 fathoms, where the bottom is too loose to stick to the lead. To the N.W. of the Skagen, at the distance of between 4 and 12 miles, the depth is about 50 fathoms and the bottom a very particular kind of clear blue clay; from thence you may shape a course for the Kattegat, by closely attending to the lead and by not shoaling the water to less than 25 fathoms, in which depth of water the bottom to the westward of the lighthouse, off Old Skagen, consists of sand and shells; but to the eastward of the lighthouse, off the point and the reef, of sand and bluish clay. If the land is not seen, and the wind is not dead on shore, you may close still nearer in with the land, into 20 fathoms; but by no means nearer, until you feel perfectly satisfied of being to the eastward of the reef, as this depth of water extends only a third of a mile outside of the shoal water on the coast, and two-thirds of a mile to the northward of the point of the reef. It therefore must be under most extraordinary circumstances if from thence you do not see the land or the lighthouse; but even in that case you may still find your way into the Kattegat by a watchful attention to the lead, if favoured by a wind which is free, and not so high as

Entering the Kattegat along the Swedish shore.

to prevent your approaching the Swedish coast without apprehension. You may then continue to stand a little farther in than 20 fathoms water, remembering that the current will carry you very fast towards the coast of Sweden; and this will oblige you to alter the course successively more and more to the southward, till at last you will have to steer between S.S.E. and S. in order to keep in that depth of water. You will then know by the chart your position to be about the parallel of the Skagen, and in the meridian of Læsö, and must then act according to circumstances; with a westerly wind, shaping a course for the Trindelen light-vessel; or, if the wind permit you to make free with the Swedish coast, stand direct to the E. or E.S.E., so as to fetch by the lead into the deep-water channel. This channel, discovered of late, runs along the coast of Sweden, its inside edge lying about 7 miles from Marstrand, and 4 miles from Vinga, its breadth being about 2 miles, but narrowing to the southward, and the depth about 50 fathoms, with black clay in mid-channel, but this depth decreases rather quickly to 40 and 30 fathoms on both sides.

This channel affords an excellent direction, particularly when the wind so far hangs to the eastward as to permit you to make free with the coast of Sweden; with contrary winds, when beating up, it becomes a point of departure, from which vessels may stand in by the lead upon the two flats of the Skagen and of the Trindelen, or in the indenture between these flats, where the depth is from 20 to 24 fathoms, and the bottom sand and blue clay. On the flat of the Trindelen the depth is less than 20 fathoms, with a bottom of sand and gravel mixed with stones; and on the N.E. corner of the flat the depth diminishes abruptly from 20 to 14 fathoms.

12. With N.E. winds accompanied by snow or sleet, in which circumstances making the Kattegat must be more or less precarious, this deep channel, along the Swedish coast, affords an excellent direction, for by employing the lead you may keep along the west side of the channel, until past Vinga, and then steer towards the east banks of Læsö. With westerly winds, on the contrary, it would be preferable to keep to windward, and when being sure, by means of the lead, of having passed the Skagen, then beat up in

Aalbek Road.

the bay of Aalbek, where under such circumstances you will find an excellent roadstead, and where you may wait for a change of weather.

13. Formerly the navigation of the Kattegat was considered uncommonly dangerous, but in the present century the relative positions of the different coasts and dangers are so exactly laid down in the chart, so many efficient means have been taken to warn the navigator, and ships are so much better fitted out, that the danger is by no means considerable, and accidents and shipwrecks, even with the increased number of vessels (fraudulents excepted), rarely occur. *Navigation of the Kattegat not dangerous.*

14. Damaged vessels may find refuge in Helsingör (Elsinore), where the harbour will admit such as draw 16 feet; and in Frederikshavn, those that draw 14 feet. *Helsingör.*

15. The Kattegat may be considered as consisting of two different channels, one to the eastward and one to the westward of the range of island and sandbanks which divides the Kattegat longitudinally from north to south, and are named accordingly the East and the West Channels. Each of these channels has a sufficient depth of water for ships of any burden, but until of late the western channel has only been used by ships bound to the Belts or to the harbours in Jutland, the great majority of vessels always passing through the eastern channel. Although the navigation of the eastern channel has of late been rendered much more safe, owing to the light-vessels at Trindelen and Knoben (the eastern end of the Anholt reef), by which these two dangers are changed into directing points, still it would be advisable under certain circumstances to take the western channel. The current in this channel usually runs with greater strength than in the eastern channel, and as it sets to the northward for three-quarters of the year, it is obviously the most advantageous one for ships bound to the northward. *Kattegat consists of two Channels.* *Eastern Channel.* *Western Channel.*

16. The prevailing winds in these seas, and those which most frequently bring on gales, especially in the autumn, are the S.W. and W.; and as these winds generally draw more northerly between Læsö and the Skagen, and more southerly between the Kullen and Hesselö, they render the navigation more difficult by thus becoming more scant for ships bound for the northward, as well as for those bound to the southward. For this reason a ship ought not to leave the road of Helsingör, when bound to the northward, with a south-westerly wind, especially in the spring or autumn, with unsettled weather, as it may be foreseen that this wind will change to W.N.W, and freshen to a gale when near *Winds in the Kattegat.*

Læsö, and thus bring her on a lee shore on the Swedish coast, or even oblige her to look out for refuge in some one of its harbours. For the same reason ships entering the Kattegat with a westerly wind ought not always to keep away for the light vessel at the Trindelen, because, if it afterwards veers more southerly, they may find it difficult to fetch the Sound.

Refuge Port in Kattegat.

17. Being caught on a lee shore on this part of the Swedish coast, no other refuge is to be found, in case of its being impossible to weather the land, than the fiord of Kongsbacka, behind Nidingen or Hallands Waderö, the channel having too great a depth of water to bring up. With westerly gales ships ought rather to take the Skagen pretty close, and then beat up in smooth water, until they can fetch the Hirtsholm light, where a pilot may be had for the Læsö or western channel, and from whence, hugging the windward shore if required, a fair course may be shaped for the Sound. This track has the further advantage that with a westerly wind there is comparatively smooth water all along the coast of Jutland; so that vessels provided with good anchors and chains may safely ride out a gale there, the holding ground everywhere consisting of sand with clay underneath, and in a moderate depth of from 5 to 9 fathoms water. Indeed the whole western side of the Kattegat may be considered as a capacious roadstead, in which, from the shoal water and extensive flats in the bay of Aalborg, no high sea can arise, even with easterly winds, although short rippling waves may occur when the current sets strongly to the northward. In the long channel between Læsö and Jutland, from the North Rönner to Sild Rön, the island and surrounding banks afford shelter from easterly winds, and it is only northerly and southerly winds that can produce any sea in this channel.

18. Having thus explained that the Kattegat has two different channels of equal value to the mariner, we shall proceed to give a more detailed description of its coasts, islands, and dangers; and beginning with its eastern side or coast of Sweden, we shall adopt Marstrand, as the point that separates the Kattegat from the Sleeve or the bay of Bohus; its castle of Karlsteen being unquestionably the most conspicuous landmark on this coast. The lighthouse is placed on the tower of that castle, and exhibits a revolving light, which is of great importance to the navigation of the Kattegat, as it and the Fixed Light

Marstrand.

on the Skagen (or Skaw) are the principal marks for this sea. The Revolving light on Karlsteen is elevated 275 Danish feet = 282 English feet above the mean level of the sea; it consists of 16 lamps with parabolic reflectors: it never quite disappears; but exhibits every second minute a bright light, which lasts from 25 to 30 seconds. This light, with a clear atmosphere, may be seen at the distance of 6 to 8 leagues, and can never be mistaken for the Fixed Light on the Skagen. *Marstrand Revolving Light.*

19. The channel or entrance to Marstrand is called the Frith or Fiord of Marstrand, and is bounded on the north side by the dangerous rocks named the Paternosters, and on the south side by some detached rocks, named the Kräkas. The leading mark between these rocks is to bring the castle to bear East or E. by S., until a high hill on Brattœ, 5 miles inside of Marstrand, and on account of its bluish colour called Blaakull (blue mountain), is seen a little to the northward of the castle, which is the leading mark for entering. But if the wind should be scant, stand no farther to the southward than to bring Blaakull in one with the castle; whereas on the other or starboard tack the Paternosters, the southernmost of which are visible above water, may be approached within a couple of cables' lengths. In the fiord a ship may stop anywhere, and will find from 17 to 19 fathoms water with clay, except on a long bar named Hæklan, where there are 14 to 15 fathoms, but foul ground. *Paternosters. Kräkas.* *Haklan Bar.*

20. With a southerly wind you may stand past the rock Skarileya to run into the harbour of Klädsholm or Graen Road, both of which places are situated on the south-west side of Tiörn Island. The harbour of Klädsholm is a good place of refuge; it has 9 to 10 fathoms water, and the rocks are provided with rings for mooring or warping. There is another entrance to Klädsholm, between the Paternosters, directly in from the sea. *Klädsholm Harbour.*

21. In the roadstead of Graen, half a mile to the south-west of Klädsholm, there are from 13 to 17 fathoms water, and it is more convenient to get underway there with the wind from the E. or S.E., but the wind from the sea throws in a heavy swell. *Graen Road.*

22. From the fiord of Marstrand branches off the principal entrance to Uddewalla, which town is 34 miles from Marstrand. Ships of any size may pass up this channel, until within 4 miles of the town, but only vessels drawing less than 13 feet can go close up to it, owing to a bank near Sunningarne, about a mile from *Uddewalla.*

Astal Island. the town. A safe stopping place in the mouth of this entrance is on the south side of the South Astal Island, in 12 fathoms, and another, in 10 or 12 fathoms on the east side of the small *Hattan.* island of Hættan, where there is a custom-house, at which vessels bound to Uddewalla have to report.

Marstrand Harbour. 23. The excellent harbour of Marstrand has three inlets: in the northernmost one, leading in between Kö and Marstrand, there are only 19 to 21 feet water abreast of the battery of Frederiksborg; whereas the southern and generally used inlet, between Marstrand and Erholm, has sufficient water for any ship. The third inlet, Draget, or the sound between Erholm and Klöver, is used only in case of necessity: the entrance from the sea passes to the southward of a sunken rock named *Kräboen Rock.* Kräboen, as well as of the North Kräka; and this inlet likewise leads in to the southward, through Sillesund, on the inside *Patten.* of Busholm, to a stopping place under Klöver, called Patten, where the depth is 10 to 12 fathoms. In the harbour of Marstrand ships may moor alongside the quay, and excellent water is to be had from Kö Island.

Inner Channel to Götheborg (Gottenburg). 24. From Marstrand there is an inland navigation to Götheborg, through the above-mentioned Sillesund, and though very narrow, it may be taken by ships of any size; but being also very intricate, with very irregular currents, a fair wind and great attention to the helm are required. This passage may be entered directly from the sea, either to the northward or to the southward of Dörjesk; of these inlets the safest is the Svanen, close to the northward of *Rörö Island. Raven Reef.* Rörö. A good mark for this passage is the Raven reef, on the northern side of which there is a large and very conspicuous rock. A S.E. by E. course leads between the Raven and Dörjesk, right for the north end of the Kullen rock; after having passed *Rammen.* which, steer S.S.E. until abreast of Rammen Island, where there is an anchorage in 10 to 12 fathoms.

Pölsern Rocks. 25. The outer rocks, W.N.W. of Rörö, are called Pölsern, and may be approached within a few cables' lengths. Between these rocks and Rörö there is a narrow and intricate channel towards the N.E., where it joins the inner channels, and leads to the *Langö.* anchorage at Langö, in 5 or 6 fathoms.

Rörö. 26. On the south side of Rörö there is a harbour, with a narrow and intricate channel, which is only practicable for vessels drawing 13 feet. On the north-east side of Kaakerholm 3 or 4 vessels

might find a winter harbour; and from thence another channel leads past Kalö into the inner channel. *Kalö.*

27. Torborskär is rendered conspicuous by its advanced position, and by a beacon elevated 91 feet above the level of the sea, and formed of a vertical pile of wood, like a steeple, with 6 supporters; it is painted red, but on the top it has two black arms, standing in different directions, and presenting to the sea large white boards, which may be seen at the distance of 6 or even of 8 miles. The rock itself is 41 feet above water, of a reddish colour, and is steep-to on the north side. It may be passed on either side, and lies right abreast of the passage or entrance named Oos, leading between Hyppelen and Burö to the anchorage in the Kalö Fiord, large enough for any fleet to anchor in, from 7 to 9 fathoms. The entrance is narrow, but sufficiently deep for ships of any burden *Torborskär Beacon.* *Oos.* *Kalö Fiord.*

28. From the fiord of Kalö ships may proceed to sea either through this channel, or to the northward by Rammen, and through the Svanen Pass; or to the southward through the inner channel, and out to sea round Vinga. On the lee side of Linholm, a small island inside of Torborskär, large ships may anchor in 8 fathoms, but the anchorage is narrow, and exposed to a heavy swell when the wind blows in from the sea. *Linholm.*

29. Vessels not drawing more than 12 to 13 feet may pass either to the northward or southward of Torborskär and Linholm, through a narrow and intricate channel leading to Ockerö Sound, on the north side of Ockerö Island, where there are 6 fathoms water, and from whence they may proceed to the southward, through the inner channel. *Ockerö Sound.*

30. To the southward of Rörö, ships may anchor anywhere in the inner channel, in different depths of water; one of the best anchorages is Store Kalvesund, close to the eastward of Ockerö, where they can lie quite safe, in from 8 to 12 fathoms on good clay ground. Lille Kalvesund is more easterly, on the south end of Biörkö, with 8 fathoms, but the anchorage is narrow; this sound is passed in going through the inner channel from Marstrand to Götheborg. *Store and Lille Kalvesund.*

31. On the rock Kalven, which separates Store and Lille Kalvesund, there is a beacon, 48 feet high and elevated 155 feet above the level of the sea; it has a pyramidal figure, is painted red, with a small black Grecian cross on its summit. *Kalven Beacon.*

It may be seen from 14 to 16 miles, and serves as a leading mark for the pilotage in the channels to the northward of Vinga.

Varholm Sound. 32. Varholm Sound, on the south-western side of Hisingen, is also an excellent harbour for vessels passing through the inner channel, and has 4 to 5 fathoms water.

Fotö Sound. 33. Ships may anchor under the west side of Fotö, in 12 to 16 fathoms water; and Fotö Sound affords a safe winter-harbour for vessels not drawing more than 12 feet. Several inlets are connected with this harbour, all of which have sufficient water, but are very narrow. The northern inlet runs in a S.E. direction, close to the northward of Hönöboe, and along the coast of Hönö; and continues, but in a more easterly direction, into the Sound. The southern inlet, on the contrary, goes in a N.E. and E.N.E. direction, close to the westward of Fiärskär and Halleskär. From Fotö Sound ships may proceed to the Fiord of Dana and to Götheborg.

Dana Fiord. 34. The Fiord of Dana comprehends the extensive open space between the rocks abreast of the entrance to Götheborg, and *Vinga Light.* that entrance is made conspicuous by a Fixed Light with lenses of the third order, erected on Vinga, the outermost of those rocks. The lighthouse is 39 feet high, and the light standing 87 feet above the sea, it may be seen 14 miles. At a little *Vinga Beacon.* distance from the lighthouse stands the beacon of Vinga. Vinga Beacon is painted red, shaped like a pyramid, and 60 feet in height, which, added to that of the rock itself, gives it an elevation of 127 feet above the sea. On the top of the beacon there is a thin copper stem and ball, painted black, which is not distinctly visible more than 4 miles, though the beacon may be seen at the distance of 16 miles. To make it possible to run in during the night and fetch a safe anchorage in Rifö Fiord, lights have been *Böttö and Buskär Lights.* placed on Böttö and on Buskär, and are now lighted every night between 15th August and 15th April. These lights, consisting of lamps, are elevated, the first 45 and the second 82 feet above the sea. They are placed on the tops of houses 24 feet high, and in the daytime afford good leading marks.

35. Besides the above-mentioned harbours of Kalvesund to the northward of Vinga, of which we have given a description, two other valuable anchorages are to be found within *Vinga Sound and Rifö Fiord.* Vinga, viz., Vinga Sound and Rifö Fiord. Vinga Sound between Buskär and Böttö, has good holding-ground, in 15 or

16 fathoms water: as a stopping place, this roadstead is very commodious, partly for vessels outward bound, with N.W. or W. winds, and partly for those going to Götheborg and meeting contrary winds in the narrows between the rocks. A heavy sea, however, sets in there with a S.W. gale. But in the fiord of Rifö, 4 miles to the eastward of Buskär, in the inlet to Götheborg, ships may ride sheltered in all winds, and this roadstead is spacious enough for the largest fleet, in 8 fathoms water and on good holding-ground.

36. The depth decreases farther in, towards the fortress of Elfsborg, to 4 fathoms, but ships of any size will find sufficient water, until abreast of the newly-established navy-yard, 2 miles from Götheborg, where they may run aground in the mud, if they are to unload. Farther up there is a bank named Spanbanken, lying across the inlet, and carrying only 14 feet water, and with this draught ships may proceed to the old navy-yard. Vessels drawing less than 14 feet may go up alongside the quays of Götheborg; and those drawing less than 8 feet may proceed into the canals cut through the town, as also farther up the Götha Elf. If not too large to be admitted into the locks, they may even proceed, past Trolhættan, through the lakes and canals of Sweden, and so into the Baltic. These locks are spacious enough to admit vessels 120 feet long, 24 feet wide, 10 feet deep, and the least depth of water in the river and canals is 9 feet.

Götheborg.

Götha River.

Götha Navigation.

The city of Götheborg, owing to this communication with the interior, is a considerable mercantile place, where ships may find every kind of assistance.

37. Several channels lead from the sea to the above-mentioned harbours and roadsteads. The northernmost of those channels is that between Fiärskär and the Inholms, leading right on to Böttö, and is very fair. Near the entrance of this inlet there is a flat, with only 6 fathoms water, lying S.W. from Fiärskär to which attention must be paid when running in with a heavy sea, as the channel is there narrow. To the northward of this inlet, on the inside of the outermost shoal, near Halleskär, an anchorage may be taken in 7 or 8 fathoms, clear sandy bottom, from which a very narrow channel leads along Fiärskär. Close to Böttö this channel joins another one leading between the Inholms and Baaklandet or Vinga rock; this channel is even narrower than the first mentioned, and somewhat intricate. Both

Fiärskär and Inholm Channels.

these channels, however, are valuable with a fair wind and a moderate current. As before said, the lighthouses on Buskär and Böttö serve as leading marks for the principal inlet to Götheborg, to the southward of Vinga. Baakholmen, or the rock on which Vinga lighthouse and beacon are placed, may be approached on its W. and N.W. sides within half a mile, whereas on its S. and S.E. sides it is foul 2 or 2½ miles off, a ledge of shoals and rocks, some of which are visible, stretching from Vinga rock to Buskär. Buskär is on its south side clear of any danger, and may be approached within 3 or 4 cables' lengths, and between this rock and Böttö lies the principal channel leading in to the fiord of Rifö and Götheborg, for which reason these two last-mentioned rocks are provided with leading lights. To run into this channel, Vinga light must be brought to bear N., and that on Buskär a little more northerly than N.E. by E., by no means more easterly: then steer E.N.E. towards Böttö light, until Buskär light bears W.; you may then anchor in 15 fathoms, clay bottom, about half way between Böttö and Buskar, if the weather is moderate; but if it blow hard from S.W., keep closer to the latter, in order to be better sheltered by that bank, and do not come to an anchor before the lights bear W.S.W. If obliged by stress of weather to run farther in without a pilot, you may continue to steer E.N.E., so as to pass to the northward of Böttö, about one or at the utmost 1½ cables' lengths, thus bringing that light a little abaft of the beam; and then steer east until the light on Buskär is a little open to the northward of that on Böttö. This mark is then to be continued until a mile inside of Böttö, where the sunken rocks of Haalke and Viskiar are left on the port side, and the sunken rock of Bramnæs on the starboard side. When past these dangers, you may come to an anchor, taking care to bring up with the vessel's head to the northward, and letting go the anchor when Buskär light is well open to the northward of Böttö light.* Ships drawing less than 12 to 13 feet may pass between Böttö and Galterö Head.

Vinga Rocks.

Principal Channel into Vinga Sound.

38. But before any vessel ventures to run in according to the above directions, she should if possible obtain a pilot, who will be able to take her to some one of the anchorages before mentioned, or, if she is liable to quarantine, to Känsö, the quarantine harbour.

* This anchorage in the Admiralty Plan is called Hawke Road.

39. The harbour of Känsö lies 3 miles S.E. of Buskär, and is made conspicuous by a stone tower, used as a look-out, which, owing to its elevated position, may be seen afar off; its height is 27 feet, and it stands on a platform of hewn granite; but the upper part is built of red bricks, with apertures like loop-holes Two narrow channels, both of which are to the northward of Känsö, lead into the harbour; in the northernmost of these channels there are only 10 feet water, whereas the least depth in the southernmost is 5 fathoms. The harbour has 6 to 7 fathoms, and is provided with rings in the rocks for mooring, and has excellent water. On approaching, ships are hailed by a quarantine boat, and directions are given concerning the berths in which the ship is to be placed, and other matters relating to the quarantine. *Känsö.*

40. There are several other anchorages between the rocks hereabout, which may be used in case of necessity. Thus, to the southward of Känsö the rock Vargö may be passed on either side, and ships may find anchorage in Vargö Hule, on the north side of Styrsö, in 6 or 7 fathoms, clay bottom. *Vargö Hule.*

To this harbour ships relieved from quarantine must repair, to be out of the way of ships under quarantine. This sound is pretty long, but narrow; if it be the intention to come to an anchor, the anchor must be dropped when the vessel has just entered the sound; and it is necessary to moor, for which purpose rings are fixed on both sides. When passing through the sound, it leads along the east side of Styrsö, into the inner channel. In standing in from the sea towards this sound, the fairest way is to the northward of Vargö, to avoid the sunken rock of Hästbäden, bearing W.S.W. 1½ miles from Vargö. Farther to the southward, between Styrsö, Domsö, and Vrangö, there are several openings, leading to the inner channel, as likewise to an anchorage close to the eastward of Ravö. But these channels, being very narrow and intricate, are only used in case of need; they all have, however, a sufficient depth of water, excepting that to the northward of Ravö, which has only 10 to 12 feet. *Hästbäden Rock.* *Ravö Anchorage.*

41. A better and fairer inlet is Kongsö Löbet, which leads in a straight S.E. by E. direction to the southward of Lökholmar and Vrangö, with access to the anchorage under the N.W. point of Varö, in 10 fathoms water, where ships are well sheltered, except in a gale of wind from S.S.W., in which case some sea is felt in that roadstead. Ships may pass from this *Varö Grasset Road.*

place to the inner channel, and proceed either to the northward or
Varö Beacon. to the southward. As a leading mark for this channel a beacon has been erected on the rock Varö, 87 feet above the level of the sea; its four legs are painted red, but the board on the top of the beacon is white on its western side, as also an arm, which pointing N.E., shows the direction towards the inner channel.

42. This inner channel, or the navigation inside of the rocks and islands, terminates at the conspicuous though low and very
Tislarn. black rocks of Tislarn, which may be known by a red house
Pilots. built for the use of the pilots. At the distance of a few cables' lengths these rocks are on all sides surrounded by breakers, and farther off by detached shoals and rocks, of which the
Vanguard Rock. uttermost, the Vanguard rock, has only 23 feet water; it bears N.W. ¼ N. from the house on Tislarn, at the distance of 2½ miles, and is of small extent, the water on all sides deepening to 4½, 5, 6, and 8 fathoms a cable's length from the shoal, with rocky ground; and a mile off there are 9 fathoms, muddy bottom, which depth increases in approaching Tislarn
Sarö. to 18 or 19 fathoms. Sarö is another good landmark on this part of the Swedish coast, between Vinga and Nidingen; this island is remarkable by a hillock covered with wood, and beyond it may be seen, on the high ground, the churches of Valda and Onsala, which show them well to the westward of them.

Inner Channel to Götheborg. 43. Ships of any size may pass from the southward through the inner channel or inlet of Götheborg, into Rifö Fiord; but if they draw only 14 feet they need not go into that fiord, but proceed direct from Asperö to the city. The principal entrance to this inlet is between Matskär on the western side, and the sunken rocks Viten on the eastern side. At Tislarn a pilot may be had for this navigation, and on Matskär, close to the
Matskär Beacon. S.E. of them, there is a red beacon, elevated 50 feet above the level of the sea, and in the form of a steeple, with a round board painted white on its western face. S.E. by E., half a mile from Matskär, lies a sunken rock, named Matskär Bade, which has only 5 feet water over it, but it is steep-to. S.S.E.
Viten Rocks. 2½ miles from the Tislarn is the Outer Viten, and a mile to the eastward the Inner Viten, both of which are sunken rocks, on which the sea breaks with ever so little wind; they are on all sides steep-to, and a fair channel is to be found between them and Tranebraka, a rock visible above water.

44. These fair and spacious channels give access to the inner channel, inside of Varö, on which there is a beacon, and this passage leads to a good roadstead to the eastward of Vrangö, in 9 or 10 fathoms, where ships will find a good berth, though a southerly wind may occasion some swell. This channel has, however, a danger: Varholm, a sunken rock, with only 6 feet water, lying in mid channel and N.E. from Varö. This rock must be avoided, and is generally left to the eastward. *Vrangö Roaa.* *Varholm Rock.*

45. In case of necessity ships might stop in Askim Fiord, to the eastward of Fiorholm, in 10 to 12 fathoms, but S.W. gales set in a heavy sea. If becalmed, ships might drop an anchor on the east side of the islands which form the outer channel, between the harbours of Vrangö and Malö, in 13 to 15 fathoms; but the bottom being alternately rock and clay, its quality ought to be ascertained by sounding, as it is desirable to avoid the rocky parts, especially when not provided with chains. *Askim Fiord.*

46. Vessels that are afraid of a lee shore on that part of the coast near Tranebraka Rock, might find a refuge in the harbour near Keholm, to the N.W. from Särö, where good holding ground is to be found in 6 or 7 fathoms, and also a little farther to the southward, where the anchorage is more spacious. Ships may bring up there in 7 fathoms, and the access is easy owing to the conspicuous island of Särö, which, as before stated, has a hummock covered with wood, the only one of the kind on that part of the coast. On the top of the hill there is a pavilion, which being brought to bear E.N.E.½E. right over the middle of the sound between the Hosholms, affords a good leading mark for the entrance. Through this sound lies the passage into the narrow channel which leads along the coast inside the rocks. To the eastward of Keholm, by the Busholms, small craft may be hove down. The inlets from the sea, between the rocks of Tranebraka, Rön, Rosera, and Svartskär, have various depths and shoal patches which make it advisable not to attempt them with any thing like a swell: the greatest depth is to be found between Rön and Rosera, on which the sea breaks with the least motion. *Keholm Harbour.* *Busholms.*

47. Ships drawing 12 to 13 feet might find refuge in Lerkil, 3 miles to the southward of Särö, or in Vinbergholm, half a mile more southerly: in both of these places ships are sheltered from W. and S.W. winds, but the harbours are very small, and open to the N. W. *Lerkil and Vinbergholm.*

[D. P.]

Virkesholm and Gategärd. 48. Vessels of less than 10 feet draught may find good shelter behind Virkesholm, and still better in Gategärd, a very narrow sound under the main, N.N.E. from Virkesholm, and having 3 to 4 fathoms water.

Sandö and Öckerö Sounds. 49. Small craft frequently run in for shelter under the N.E. coast of Sandö. The anchorage in Öckerö Sound has 5 fathoms water only a quarter of a mile from the N.E. part of Öckerö, but it would be prudent to bring up even nearer to the shore, according to the draught of the vessel, as better holding ground and more shelter are found there. To the E.S.E. of this place there are some warehouses on the main, close to which ships having lost their anchors may run aground in the mud, unhurt; and to the N. E. of the anchorage in the sound, vessels drawing 8 to 10 feet may heave down, under a point of the main.

Svartskär. 50. To run into Öckerö Sound* you must pass to the southward of the prominent rock Svartskär, and bring the loftily situated church of Onsala to bear E. by N., or just in one with an opening between the rocks to the northward of Öckerö Island.

Grundebädan and Koggebädan. Ships drawing only 14 to 15 feet may find another channel to the S.E. of Öckerö, but it is very narrow and intricate: in passing this way, attention is required to the shoals of Grundebädan, on which there are only 4 feet, and of Koggebädan, which has 5 feet. The former is 3 miles from both Öckerö and Malö, and the latter is one mile N.N.W. off the west point of Malö. These sunken rocks are to be carefully avoided in standing in for Malö Sound.†

Malö Sound. 51. The Island of Malö is very low and barren, with a yellowish hue, by which it may be known, as well as by three small piles of stones, erected close to each other, on its highest part. An excellent landmark in standing into Malö Sound, to the northward of the island, is a beacon shaped like a steeple and placed on Cape Hälsund, which is 58 feet high, and the height of the beacon itself being the same, it has an elevation of 116 feet, so as to be seen 12 miles off. The beacon carries a barrel painted black, and the middle part is painted white, standing on supporters. This beacon, being brought to bear S.E. by E. rather easterly, is then in one with the middle part of the opening of the sound, close to the northward of Malö Island; and this leading mark carries

Hälsund Beacon.

* View 1. † View 2.

you safely between Grundebädan and Koggebädan, and into the sound, from which a ship may proceed to either of the harbours within Malö, viz., Klofiord, Mönster Sound, Skala, and Varren. *Klofiord, Mönster, and Varren Harbours.* Klofiord, or the Gräset, is the best of these harbours, and also the most spacious, it has 5 to 6 fathoms water, and the bottom is grass with clay underneath: it is accessible on both sides of Malö Island, and may be left with all winds from S.E., round by E. and N., to W. Mönster Sound is close to the westward of Klofiord, and is an excellent winter harbour for vessels drawing only 14 feet; for the southern mouth of this sound is shut by a bar, with 6 to 7 feet water only, by which it is sheltered from the sea. Skala is to the eastward of Gräset, and bends towards the N.E. Ships may let go the anchor there according to circumstances in 5, 4, or 3 fathoms, but it is requisite to moor directly by fastening them to the rings supplied on both sides; and a ship having lost her anchors, might be run aground in the mud unhurt. The harbour is exposed to some swell in gales of wind from S. and S.W., which is likewise the case in Varren, the anchorage between Malö and Cape Hålsund, where vessels find a snug berth in 10 fathoms, good holding ground, and perfectly landlocked. No other direction is requisite for entering this sound and its harbours from the southward, than having due attention to the bearings of the beacon of Hålsund; secondly, to mind that the S.E. end of Malö is foul 2 cables' lengths off; thirdly, that a reef stretches out from the westward of this island to the distance of a few cables' lengths; and lastly, that S.W. half a mile from Malö lies Bredaberget, a shoal with 9 to 10 feet water only. *Bredaberget Shoal.*

52. To the S.W. from Malö, and 3 miles from the main, is the remarkable rock of Nidingen, the highest part of which is only 14 feet above the water's edge. Two reefs stretch out from this rock: one W.S.W. to the distance of half a mile, called Klokfoten; and the other E. by S. half a mile, with a breaker at its outermost end, called Lilleland. On its south side the ground is foul a third of a mile off, but on the north side it is steep-to. On the most elevated part of the rock there are two towers of stone, hexangular, 41 feet high, and whitewashed 11 feet from the top. On each of these towers there is a Fixed Light with lenses of the third order; and the pointed tops of the lanterns are 66 feet above the level of the sea: they lie E.N.E. and *Nidingen Rock.* *Nidingen Lights.*

W.S.W. of each other, and 33 yards apart. A little to the northward of the towers there is a house roofed with red tiles for the use of the lightmen, and a storehouse to the southward, in a line between the towers. S.W. from the western tower stands a belfrey, with a large bell which is tolled in foggy or thick weather. In a clear atmosphere the lights may be seen 13 miles; and owing to their position they are of the highest importance to the navigation of the Kattegat at night, as well as the lighthouses during the daytime, as they afford an excellent leading mark for the fiord of Kongsbacka, which having a sufficient depth of water, plenty of room, and extending inland somewhat more than 4 miles, may prove a refuge of great value to ships on a lee shore or in distress.

Kongsbacka Fiord.

Land marks for the Fiord.

53. Besides the Nidingen rock and the beacon on Cape Hålsund and the three piles of stones on Malö already described, Onsala church is a very conspicuous object. The church has an elevated position; the walls are white, with a roof of red tiles; and to the westward of the church there stands a small red turret. Another landmark is Ramnö Rös, a large heap of stones and whitewashed, on the top of Ramnö, which island is in the middle of the fiord, and may be seen 12 miles off. Lastly on the rock named Fiolskär, in the same fiord and close to the eastward of the point of Hålsund, there has been erected another beacon, with two branches pointing eastward in the direction of the channel.

Kongsbacka Leading Marks.

54. Coming from the sea, the leading mark for the fiord of Kongsbacka is Onsala church in one with Hålsund beacon; when Ramnö bears between N.E. and N.E. by N. the fiord is open to the view, and appears like a sound. Then by keeping midchannel, to the eastward of Fiolskär and to the westward of Ramnö, until Onsala church bears N.N.W., you will reach the common anchorage in 8 to 12 fathoms soft clay; but farther in, 5 or 6 fathoms water will be found close to the westward of Kalfö, and close to the rock Pasberget 2 to 3 fathoms only.

Pasberget Rock.

Kongsbacka Road.

55. To the northward of the latter rock lies the roadstead of Kongsbacka, but with not more than 10 feet water; and farther up, the fiord is navigable for boats only. The holding ground is good everywhere in the fiord, and the swell in gales from S.W. is less perceived the farther you advance up it; moreover, there is plenty of room to beat out in moderate weather. At Gatskal, on the western side, water can be obtained, and vessels

not drawing more than 9 feet may find a safe winter harbour there. *Gatskal.*

This fiord is thus an excellent place of refuge, especially for vessels bound to the southward or to the Sound, and meeting contrary winds, but it has hitherto not been so frequently resorted to as it deserves.

56. On the east side of the fiord lies Ulmevik, or the harbour of Tilö, where there is good anchorage in 4 fathoms, sandy bottom. The entrance to this harbour is to the eastward of Ramnö and Vindö, along a part of the coast named Näskrok, and may be used by ships drawing 19 feet, but the passage from this place to the deep-water channel in the fiord cannot be attempted by vessels drawing more than 15 feet. *Ulmevik.*

57. Between Näskrok, the east point of the mouth of Kongsbacka Fiord, and Ringhals Point to the southward, there is a deep bay with several islands, on the lee side of which there are two anchorages; one on the east side of Nordstö, between it and Kedholm, in 5 to 6 fathoms, clay bottom. The marks for it are Hålsund beacon over the north end of Nordstö, and Ringhals Point open to the eastward of Bratö: in gales of wind, however, and with a rough sea, some swell sets in here; which is likewise the case with a W.S.W wind at the other anchorage, on the south-east side of Wendelsö. There vessels ought to bring up abreast of the houses, a couple of cables' lengths from the beach, in 5 fathoms with fine sandy bottom, where they will ride tolerably sheltered. It is prudent to anchor under Wendelsö Island, and not to run further into the fiord, as the holding ground is not good, owing to the bottom being overrun with seaweed. *Ringhals.* *Nordstö.* *Wendelsö.*

58. Between Almö and the mainland the water is too shallow to allow vessels that draw 16 feet to pass through the northern channel to Wendelsö, and those that can take that channel must go to the westward of a rocky shoal, just visible above the water, and bearing S.E. from Almö. In the southern channel to Wendelsö, the coast near Ringhals, as also the visible low rocks, are steep-to, but, on the other hand, the Rygas shoal has 12 and the Viten rock only 5 feet water, and on both of them the surf shows with the least motion of the sea. *Almö.* *Rygas and Viten Shoals.*

59. In the mouth of Bätefiord, to the southward of Ringhals, there is an anchorage in 3 fathoms, which may be approached by passing to the northward or to the southward of the rocks Baggen *Bätefiord.*

and Gylten, but it is entirely open to westerly winds, and farther in the fiord is inaccessible, owing to shallow water.

Kloster Fiord. 60. Kloster Fiord likewise is much exposed to westerly winds, but still the anchorage there is much preferable to that in Bätefiord, *Kraken.* and best close to the rock Kraken, in 3 to 4 fathoms, clay and sand; farther in the fiord the depth decreases considerably towards the mouth of Kloster river, where it is only 3 to 4 feet. *Lahall.* Fresh water can be procured in the two villages Lahall and Linnäs. Outside of the fiord ships might anchor on the S.E. *Hertan.* side of the North Hertan rock, in 5 or 6 fathoms, clay bottom; but at the distance of a few cables' lengths from the rock, in order to avoid a reef stretching out from it in that direction.

Baliö and Getterö. 61. Baliö and Getterö are connected with each other and with the mainland by a very shallow bank, through which, however, there is a channel up to the N.W. point of Getterö, where vessels not drawing more than 12 feet may stop in case of need, but entirely exposed to westerly winds. About the distance of 2 miles from these islands, and 4 miles from the coast, stands a *Klabäck.* pretty high reddish rock called Klabäck, which on its northern and western sides may be approached within a few cables' lengths, whereas between it and Baliö, as likewise farther to the southward, there are several small rocks and shoals.

Warberg Harbour. 62. Warberg castle is an excellent landmark, and may be seen far off. The harbour has only depth enough for vessels drawing less than 15 feet, is quite open to S.S.W. wind, and the anchorage is so steep that it is safer with the wind on shore than with a gale from N.W. or N. A mark to facilitate the entrance is a pole 35 feet high, having on the top a barrel painted black, and placed on Appelvik hill, a mile to the southward of Warberg. In approaching the harbour the castle must be brought to bear E.N.E; and in steering this course, a small rock, *Skalklippen.* Skalklippen, just visible above water, is left a couple of cables' lengths to the eastward; the castle is then to be kept at 1½ cables' lengths distance, on the starboard hand, and as soon as the church opens to the northward of the castle you may let go the anchor in 3 to 3½ fathoms on a fine sandy bottom. Small craft may be better sheltered nearer the wharf by the castle; there is likewise *Skriverklippen.* anchorage abreast of Skriverklippen in 4 to 5 fathoms, but more exposed to the sea. On this last-named rock there is a house *Pilots.* painted white and covered with red tiles, for the use of the pilots;

and to the westward of the rock lies Bursen, the outermost shoal, to the southward of which you may pass by keeping the church of Warberg to the southward of the castle. Coming from the northward or westward, continue on this leading mark until the castle bears E.N. E., and when abreast of Skriverklippen you may round that rock and enter the harbour as above directed. The coast to the southward of the harbour is fair, and may be approached within a few cables' lengths. *Bursen Shoal.*

63. Close to the point of the Ness stand two rocks, which from their colour are named Svartskär, and Rödskär (black and red rocks). On the inside of Svartskär, 3 miles to the southward of Warberg, there is an anchorage for craft not drawing more than 7 to 8 feet; and rings for mooring will be found on the rock, as also on the point of the mainland. *Ness.* *Svartskär.*

64. To the southward of this rock the coast is entirely open, without any off-lying islands or shoals; but we shall here mention, as some of the most remarkable objects that it presents, the whitish beach of Morup Tånge, where there is a lighthouse, and church with its pointed steeple painted red, and a windmill not far off; next, the church and town of Falkenberg, which are very conspicuous; and likewise Smörstacken, a high hill, 4 miles to the southward of Falkenberg, with a remarkable pile of stones on its summit, and a single tree on its south side.* Sönrum church is white, and the church tower of Halmstad is easily distinguished when entering the bay. The surrounding coasts of Halmstad Bay are low and whitish, as far as Hallands Ås, a high dark range of mountains, of which the outermost end, Häfs Kulle, forms the southern extremity of the bay. *Morup Tånge.* *Falkenberg.* *Smörstacken.*

65. On Morup Tånge, 4 miles to the northwestward of Falkenberg, there is a Fixed light, with lenses of the second magnitude, and elevated 95 feet above the level of the sea, and visible at the distance of 15 miles. The lighthouse is 70 feet high. *Morup Light.*

66. Boats not drawing more than 4 to 5 feet might find a refuge to the southward of the rock Galtabak Skär: the direction of the inlet is E. by S. *Galtabak Rock.*

67. Bergs Reef carries from 4 to 10 feet water, and lies 6 miles to the southward of Warberg, and 1½ miles from the coast. It is half a mile long, and inside of it the ground is foul; but on *Bergs Reef.*

* View 3.

the side facing the sea, and close to the reef, there are 5 to 8 fathoms, which steepness makes it difficult to approach by the lead.

Lyngens Haven.

68. Three miles to the northward of Morup Tånge the small haven of Lyngens will only admit vessels drawing 10 to 11 feet. Close to the northward of that harbour, on a small rock, stands the Ugga Beacon; and when entering, steer S.S.E., so as to leave that rock a cable's length on the port side. When 2 cables' lengths past the rock, the anchor must be dropped, in 2½ to 3 fathoms. The western side of the anchorage is bounded and sheltered by a reef with shoal water connected with the main. The coast about Morup Tånge not having been fully examined and surveyed, ought not to be approached nearer than 2 miles. From the Tånge a ledge of sunken rocks runs out to the southward, the end of which is a rock named Karet; behind this rock is

Korshavn.

Korshavn, where boats not drawing more than 4 to 5 feet might find some shelter in case of necessity. The course in entering this place of refuge is N.N.W.

69. In the bay to the southward there are several dangerous shoals, and the shoal water extending from the beach is interspersed with rocks.

Victoria Rock.

70. W.S.W. ½ W., 2½ miles from the Morup lighthouse, lies the Victoria Rock, on which it is said that a ship struck in 7 feet water.

Falkenberg Roadstead.

71. Facing the mouth of the Ätra rivulet, on which the town of Falkenberg is built, there are several shoals and reefs, forming a pretty good roadstead; but without the assistance of a pilot, it ought to be approached with much circumspection. The outer or westernmost of these reefs is Skotta, having 6 feet water, and lying 2 miles W. by S. from the mouth of the rivulet.

Skotta and Mellem Reefs.

Half-way between this reef and the rivulet, Mellem Reef extends a mile to the southward, being 2½ cables' lengths wide, with 4, 5, and 6 feet; and at its outer extremity 10 feet water. Close to the east side of this reef is the anchorage, or Falkenberg Road, which is thus sheltered by it from the western sea. Close to the northward of the anchorage there is an insulated shoal named Rosengard Reef, with only 6 feet water; but vessels drawing less than 12 feet may pass between it and Mellem Reef, and inside of those two reefs they will be much better sheltered.

To avoid the Skotta Reef, Stafsinge church must be kept only

a quarter of a point to the westward of Falkenberg church; but strangers ought not to proceed farther in, by this leading mark, than as far as the Marsten, (of which hereafter,) yet it is to be seen in upon the backland; they will then be in 5 or 6 fathoms water, and it will be prudent to wait there for the pilot; they will then have to proceed, on the before-mentioned leading mark with Stafsinge and Falkenberg churches, until they perceive a mark for the entrance erected on Læsten, and consisting of a steeple-shaped beacon painted red, and carrying a white board, shaped like a barrel, in a horizontal position. The ground at Læsten on which this beacon is placed, is 11 feet high, and the beacon itself rises to 64 feet above the sea; so that in clear weather it may be seen far off, and as soon as it is seen, it must be brought in one with Falkenberg church. Continue on that mark, steering a north-easterly course, until the western part of Rödskär comes in one with Smörstacken, when the course is to be altered to N. by W. or N.N.W.; and immediately after, the anchor is to be dropped in 17 feet water, clay bottom, inside of Mellem Reef and Rosengard Reefs. In entering, the least depth of water will be 12½ feet, a short distance from the place where the course is altered. *Rosengard Reef.*

72. This roadstead is well sheltered against N.W. and S.W. winds by the Mellem rocks, though, being only just above water, they allow some sea to set in; but winds from S.W. to S.S.E. occasion a bad swell, though not a dangerous one in this roadstead. *Mellem Road.*

73. The mouth of the Ätra rivulet is surrounded by a reef which separates it from the road: this reef runs nearly parallel to Rosengard Reef. By continuing to keep the above leading mark (the beacon in one with Falkenberg church), and proceeding farther in, the channel will be reduced to about 6 feet water. Across the north side of the inner reef a passage will be found, but only for small boats.

74. Lybecka Reef, a mile to the southward of the rivulet, and 8 cables' lengths from the beach, extends N. and S. two-thirds of a mile, and some parts of it have only 5 to 9 feet water. From this reef Falkenberg church bears N. by E. 2 miles, and the reef is to be left on the starboard hand in running for the roadstead. Along this shore a mile off, the depth of water is from 18 to 21 feet, but it soon increases to 5 fathoms, and 2 miles off there are 10 fathoms. *Lybecka Reef.*

Marsten Rock. 75. Marsten is a remarkable rock, 4 miles to the southward of Falkenberg or Ätra rivulet, and 1½ miles distant from the coast, but vessels ought never to attempt the channel inside of it, owing to the variable depths and to the several insulated patches and breakers, which altogether make the channel impracticable. The rock may be approached on the sea side to within a few cables' lengths.

Vessels drawing only 9 or 10 feet may pass inside of the rock
Fogelholm. Fogelholm, situated 3 cables' lengths from the shore, and lie
Stensiö Haven. sheltered in the narrow anchorage of Stensiö haven, which is the loading place for the brick-manufactory at Stensiö. The rock Fogelholm may be passed on either side. The course in entering to the northward of the rock, by steering for its northern end, is E.S.E., whereas it is E.N.E. towards the southern end of the rock in entering from the southward; in passing this way, a small rock, just visible above water, is to be left on the starboard side.

76. To the southward of the point of Skallen there is an anchorage in 3 fathoms, a quarter of a mile from the beach, but entirely exposed to all winds blowing from the sea; vessels may also come to an anchor on the east side of the rock Tylen, somewhat less than a cable's length off its south-eastern extremity, in 3½ to 4 fathoms, but they will be greatly inconvenienced by the swell with all westerly winds. To this anchorage channels lead from the N.W. and from S.S.W.; but the N.E. point of Tylen is foul fully a cable's length off, and the shore of the mainland ought not to be approached within a quarter of a mile. S.W.,
Tylö Ground. 6 cables' lengths off Tylen, lies Tylö Ground, having 6 feet water on it, and 6 to 8 fathoms all around.

Sandhavns Creek. 77. Sandhavns Creek, 1½ miles S.E. from Tylen, and at 1½ cables' lengths from the beach, affords another anchorage in 3 fathoms, bottom sand and clay, well sheltered against winds from N.W., N., and E.

Laholm Bay. 78. The bay of Laholm or Halmstad has all over it a clear sandy bottom, with clay underneath; the depth is from 10 to 6 fathoms, gradually shoaling towards the shore, along which, at a distance of 4 to 5 cables' lengths, the water is very shallow, and accordingly this bay is well known as a place where ships provided with sufficient ground-tackle may ride out a gale. Nevertheless it is to be observed that a wide belt of rocky ground crosses the

bay from Höghalla point to Päarps Reef, in the direction of N.E. and S.W., which is indicated in the chart. *Rocky Bottom.*

79. Hitherto vessels have been obliged to load or unload near Halmstad, in a very much exposed roadstead, a mile W.S.W. of the mouth of the rivulet Nissa-an, Halmstad castle bearing N.E. and Sönrum church N.W., the rivulet being accessible only for boats. But lately it has been contrived by means of fascines to make the current from the rivulet force a channel, which now has 10 feet water on the bar; but still, only vessels drawing 7 to 8 feet can find a sufficient depth of water to come alongside of the wharfs in the town. S.E. 2½ miles from the mouth of the rivulet is Päarps Reef, extending N.W. and S.E. in continuance of Päarps rocks. The reef is 2 to 3 cables' lengths across, and carries 10 to 11 feet water. From its extremity rocky ground extends in a northerly direction towards Langnäs, carrying 6 to 8 fathoms, whereas to the eastward of this rocky ground sand and clay are found, and in some places seaweed. *Halmstad.* *Päarps Reef.*

80. At Laholm the rivulet Laga only admits boats drawing 4 feet, though it has deeper water inside the bar. *Laholm.*

81. Off Bätstad, a thriving village on the southern side of the bay, vessels drawing 8 to 10 feet may anchor in 3 fathoms, a quarter of a mile to the north-east of the village, and ride out a gale of wind blowing on the shore, for the fury of the waves is broken by the gradually shelving bottom. Closer in and along the coast there is a ridge with only 5 feet water. Larger vessels may anchor a short mile from the town, in 6 or 7 fathoms, the church bearing S.W. *Bätstad.*

82. Höghalla Point forms the southern side of the entrance to the bay of Laholm, as it is likewise the north point of the Toreko shore. From this point the mountain ridge, called Hallands Åns, suddenly rises, and may be seen 20 to 25 miles off. Hallands Åns, and another range of mountains named the Kullen, are the only high lands on this part of the coast, and as they extend in a direction parallel to each other and not far distant, mistakes may sometimes happen, by one of these high lands being taken for the other, and thus vessels may find themselves running into Skelder Vik, the bay to the southward of the Kullen, instead of into the Sound. From this resemblance, the former headland has been sometimes called the False Kullen. *Höghalla Point.* *Hallands Åns Mountains.* *False Kullen.*

To prevent any such mistake it will be enough to observe that the ridge of Hallands Ås consists of hills of some length, gradually sloping on both sides, whereas that of the Kullen consists of more numerous and shorter hummocks, with steep sides. Again, in approaching Hallands Ås, the churches of Håf and Wester Karup may be easily distinguished; whereas on the Kullen the lighthouse only will be seen, and standing on the utmost point, which is lower than the land behind it.

Toreko. 83. Toreko church, on the low beach, is remarkable by its broad white gable, but it is hidden by Hallands Wäderö while bearing between S.S.E. and E.S.E. Wäderö or Wäder Island itself, being low and partly covered with stunted trees, is difficult to discern from the N.W.; but when to the northward or southward, it separates from the coast behind it. The anchorage inside of this island is of great use to ships meeting with contrary winds or being caught on a lee shore, whether bound to the northward or southward.

84. The beach between Höghalla Point and the village of Toreko is covered with rocks; the adjacent ground is all foul; and in the vicinity of Toreko lies the Källarstene, which rock is about 7 cables' lengths distant from the coast.

Hallands Wäderö. 85. Coming from the northward and bound into Skelder Bay, steer towards the Wrenen, a small rock to the eastward of Wäderö, on which stands a beacon, with an arm pointing eastward, to signify that the rock is to be left to the westward. This rock is 20 feet high, and the beacon itself 24 feet, so that it may be seen 4 or 5 miles off. A mile farther southerly there is another rock, Wingaskär, which is somewhat larger than the former, and appears to be divided into two parts, by being low in the middle; on this rock also there is a beacon, somewhat smaller, but of the same shape as that on the Wrenen, and visible equally far off Halfway between these rocks is the best anchorage, in 9 to 10 fathoms, bottom sand and clay. The highest part of the island then bears N.W.; the Wrenen N.N.W. and is seen separated from the island; Wingaskär bears S.S.W. to S.W. by S.; Toreko church S.E.¼E. in one with a little grove inland; and the lighthouse on the Kullen in a line with the low part of Wingaskär. This anchorage is sheltered against all winds from N.N.W. to S.W., though the swell is sometimes felt; but it is entirely exposed to northerly and north-

Wrenen and Wingaskär.

Beacons.

Wrenen Road.

easterly winds. Farther to the southward, the holding-ground is not so good, and towards Toreko the bottom is foul, and ships riding there are exposed to the N.W. Water is not found on the island, but must be fetched from Toreko, where there is an excellent harbour for boats, and good pilots. *Toreko Harbour.*

86. Coming from the westward or southward, the course is directed towards Wingaskär, which, together with the breaker to the W.S.W. of it, must be kept on the port side, at the distance of a cable's length till abreast of Wingaskär, when the course may be shaped for the anchorage. Vessels drawing 7 to 8 feet only may lie well sheltered in Kapelhavn, a small harbour on the south side of Wäderö, to which the inlet is in a north-easterly direction, and where vessels may find even a winter harbour, though somewhat exposed to the sea with southerly winds. *Kapelhavn.*

87. It is to be observed, that the direction of the current between Toreko and Wäderö is invariably contrary to that in Laholm Bay. *Current.*

88. The coast of Skelder Bay, or, as it is by some called, Engelholm Bay, is low as far as Svanhals Point, where the mountainous ridge of the Kullen commences. Ships that by mistake may have entered this bay, have no other resource than to anchor; but they may ride out even a gale at N.W., if, keeping midway in the bay until Jonstorp church bears S.W., they anchor in 9 or 10 fathoms, in which position the holding-ground is good and the sea somewhat smoother, whereas the holding-ground on both sides of the bay is indifferent. *Skelder or Engelholm Bay.*

89. On the east side of the bay, full 6 miles from Toreko, and 5 to 6 cables' lengths off the beach, lies Grytskär, inside of which rocks there is foul ground, and nearly a mile N.W. from them is Killebäcks shoal, with only 4 feet water. *Grytskär.*

90. A mile to the southward of Grytskär, the small harbour of Gryte-havn is formed by a couple of rocks, 3 cables' lengths from the beach, and affording some shelter, with anchorage in 8 or 9 feet. *Gryte-havn.*

91. Abreast of the village of Magnarp, a mile to the S.E. of Wiby Point, there is an anchorage in 3 fathoms, from 1½ to 2 cables' lengths off the beach; and to the southward of it a reef, which stretching 4 cables' lengths to the westward, shelters the anchorage from south and west winds. *Wiby Point.*

Engelholm. 92. The loading place for the small town of Engelholm is at Skippar-kroken, which lies a mile to the northward of Engelholm river; the anchorage there is 2 cables' lengths off shore, and an excellent road leads from the beach to the town. On the south-west side of the bay there is another loading place, *Halsa Road.* abreast of Halsa Road, where vessels drawing 10 or 12 feet may anchor in 3 fathoms, clear sandy ground, and half a mile from the beach, towards which the water gradually shoals. In the *Arild.* village of Arild, 4 miles inside of the Kullen, live fishermen, who are well acquainted with the bay and its anchorages. The north and west sides of the Kullen are steep, and a cable's length off the depth is 14 fathoms.

Kullen Light. 93. The lighthouse on the Kullen is a round building of stone, 25 feet high. Formerly the light was fixed, but lately it has been made to revolve, though with a slow motion, to distinguish it from the revolving light on the island of Anholt; its flashes of brighter light last 30 seconds, with intervals of a minute and a half between them.

The houses built close up to the lighthouse give it the appearance of a church, particularly when seen from the southward. The lighthouse is whitewashed, to be the more discernible as a landmark during the day. The elevation of the light above the level of the sea is 288 feet; and in a clear atmosphere it may be seen 18 to 22 miles; yet in thick weather, the clouds sometimes hang on the ridge where the lighthouse stands, and therefore if the light were placed much lower, it would be seen much more constantly and certainly; for it has happened that the fire at the coal-mines of Höganæs, 5 miles to the southward of the Kullen, has been mistaken for that light, until the lights of Nakke Head have hove in sight.

CHAPTER II.

THE COAST OF JUTLAND, FROM THE SKAGEN TO THE LITTLE BELT.

94. NEAR the north point of Jutland stands the village of Skagen, consisting of three divisions, the East-town, West-town, and Old Skagen. To the eastward of all rises the important light-house of Skagen, 69 feet above the level of the sea: the Light is Fixed, and shows itself on all points of the compass from W. ¼ N. round by the northward to S.W., and is visible 13 miles. It is sheltered from the westward by a sand-down of 140 feet in length, and 40 feet wide. *Skagen or Scaw.* *Light.*

95. The narrow neck of land between the lighthouse and the extreme point is named the Grenen, and consists of very compact hard sand without stones. From that point a spit extends E.N.E. exactly 2 miles; it consists of a hard white sand, with no other stones than those thrown there occasionally from ships in ballast. *Skagen Spit.*

From the extreme point of that spit, its eastern side takes the direction of S.W. ½ W. until abreast of the lighthouse, towards which it then trends, until it merges in the shoal water that extends about 600 to 700 yards off the shore. The spit, on which there is a surf in blowing weather, thus forming a curve towards S.E., has given rise to the denominations of N.E. and S.E. necks of the bank, and these expressions are commonly used by the inhabitants of Skagen, and even the charts of former times represented the spit as having two forks, which it has not now. Neither has it been proved that it has undergone any change in its direction or extent from former gales or storms.

96. On the south side of the spit the depth gradually increases, so that the soundings are a good guide; whereas on the north side it is steep-to, and ought not to be approached within 12 fathoms of water, which suddenly drop into 4 fathoms. During the daytime the edge of the spit is easily distinguished from aloft by the colour of the sand, which shows through the water. A large black and red chequered buoy carrying a red pole with a red *Spit Beacon.*

Floating Beacon. ball has been placed at the end of the spit, in 4½ fathoms, with the lighthouse and the old church tower in one; but there can be no certain reliance upon its remaining unmoved. Another beacon with 2 brooms has been placed at the S.E. extremity of the reef, in 4 fathoms, the lighthouse bearing W.N.W., and the old tower W. This beacon and buoy remain in their places till carried away by the ice, when others are as soon as possible substituted for them.

Current. 97. The direction of the current here is commonly W.S.W. with northerly and westerly winds, and E.N.E. with southerly and easterly winds. In gales of any of these winds it may attain a velocity of 4 knots, whereas with moderate weather it seldom runs faster than a single knot. In easterly storms the ice is piled up on that part of the spit where there is less than one fathom water, and there it sometimes remains for a long time after the rest of the ice is gone. While any ice is in view that might be supposed to impede navigation, a white flag with a vertical blue stripe is hoisted on the lighthouse.

Ice.

Ice Signal.

Pilots. 98. From the Skagen pilots are to be had who are all able to bring ships to an anchor under the shore, or to conduct them to the Hirtsholms or to Fladstrand Road. Likewise a pilot-boat from Frederikshavn beats about there, in order to furnish ships with pilots for Helsingör (Elsinore), Nyborg, and Fredericia.

Aalbek Bay. 99. The bay between the Skagen and the Hirtsholms is called Aalbek Bight. The coast from the Skagen as far as Napstiert and likewise the west coast of Jutland, have two distinct bars running along the shore, and nearly parallel to each other; the outermost being at the distance of 200 to 300 yards, and reaching out to from 7 to 12 feet water; and the second is about 80 yards from the beach, to the depth of 6 feet; but between the two bars there are from 12 to 14 feet. Although the fury of the sea is somewhat abated by breaking on the outermost bar, yet the distance between the two bars is too small to afford a refuge for any vessel. The extension of shoal water from the beach is, as shown in the chart, somewhat different, but everywhere it gradually shoals; and the only insulate shoal in the bay is Krageskov Reef of rocks, lying abreast of Napstiert, 1½ miles off, and a cable's length across, with 17 feet water.

Krageskov Reef.

100. Aalbek Bight, excepting this reef, has a clear sandy bottom, and is a good stopping place for vessels in unsettled

weather with W. and S.W. winds, which generally prevail there. Water is easily procured between Aalbek and Napstiert. The coast along this bight is low and sandy, but farther in the country it is hilly, and in the northern part these hills are sand-downs. The fishermen have permission to light two lanterns with red glasses, in the interior part of the bay, from the 1st of September to the 1st of May, which lights may be seen 5 miles off. *Fishermen's Lights.*

101. Although constant attention is paid to the binding of the sand on the west coast of Jutland, yet a great quantity of it is thrown ashore by the surf of the North Sea, and moves across the narrow neck of land, whereby Aalbek beach slowly advances farther out. *Moving Sand.*

102. Between Napstiert and Bangsbo, the shallow water stretches off the coast nearly 4 miles, and on the outer elbow of this shoal lie Hirtsholm and Grassholm islands. The former or southernmost is inhabited; and they are both connected by a bar of sand, covered only by 1 or 2 feet water. On the N.W. and W. sides of Grassholm there are several small holms or islands; Pikerholm, Kousholm, Mogholm, Storeholm, Lilleholm, and Dömand, which may, however, be all considered as parts of Grassholm, the passages between them being generally dry. To the N.E. of Grassholm lie Tyvholm, and three smaller heaps of rocks, called the Naamandsreef, which is overflowed at high water. To the N.W. of Tyvholm there is also a small ledge, called the N.W. reef, on which there are 4 feet water, and to the eastward of it a small detached rock, with 10 feet water. On the N.E. side of Hirtsholm there is a small harbour called Kirkehavn, but it has only 6 feet water. *Hirtsholm.* *Grassholm.* *Kirkehavn.*

103. The only danger to the eastward of Hirtsholm is Hvidsteen Reef, and a ledge of rocks to the N.E. of Grassholm; these excepted, the eastern side of these islands may be approached within 4 cables' lengths; and to the southward of Staalhagen, the southernmost point of Hirtsholm, the beach is so steep that ships of any size may pass it within a cable's length. *Hvidsteen Reef.*

104. What made these islands dangerous was their being so low, that during the night, even in tolerably clear weather, they were concealed by the high land behind, and thus proved fatal to many vessels. For this reason, as well as to guide those that either want a pilot from Hirtsholm, or that wish to touch at Frederikshavn, a lighthouse has been built on that island, and

Hirtsholm Revolving light. since 1838 a revolving light has been exhibited there, at 43 feet above the sea, showing all round, every half-minute, a bright light, which then vanishes. The lighthouse is square, and being whitewashed, affords in the daytime an excellent landmark, which may be seen 10 miles off from the deck of a vessel.

105. The shallow flat between Hirtsholm and the shore is only practicable for vessels drawing less than 12 feet, this being the ordinary depth of water all over. The bottom is sand, in some places overrun with seaweed; but it holds well, and foul ground is only found among the reefs. On the south side of this shoal part, nearly in the direction between Staalhagen and Frederikshavn, lie the two small islands, Kiölpen and Deget.

Kiölpen. 106. Kiölpen is narrow and rocky, and bears W. by S., 8 cables' lengths from the south point of Hirtsholm. To the westward of this island in Holmhavn, vessels may ride tolerably sheltered against easterly and southerly winds, but exposed to a heavy sea with northerly winds, and are then obliged to weigh or slip and run for shelter, either to the southern roadstead or to Frederikshavn. In entering Holmhavn from the northward, across the shoal water, attention must be paid to avoid the North-West Reef, off Hirtsholm and Strandby Reef, which lies in the fair way, and the least depth of water on which being 12 feet, (as far as hitherto known,) is not very dangerous. The marks for it are the centre hill of three small hillocks, at some distance inland, in one with the southernmost house in the village of Strandby; and Fladstrand castle in one with the east point of Frydenstrand, a farm-house standing close to the southward of Moltkes battery.

Holmhavn or Holm Road.

To pass to the eastward of the North-West Reef, Fladstrand castle is to be kept close to the southward of the high land of Bangsbo, and this serves as a leading mark into Holmhavn; when the northernmost house on Hirtsholm is seen to the westward of Tyveholm, the reef is passed.

Leading Marks.

When Kiölpen bears S. by E. ½ E., the course is to be shaped towards the west side of the island, near which is the best anchorage in Holmhavn, in 2 fathoms, 1½ cables' lengths off the beach. But if Holmhavn is to be entered from the southward, to the westward of Kiölpen, do not keep more to the westward than to leave Sæby church in one with the fort on Deget.

107. Three dangerous rocks between Kiölpen and the shore

of the mainland of Jutland are the Mölle, Holm, and Poulsen.

The least depth of water on the Mölle is 11 feet. The mark for it is Sæby church in one with Döde Anders, a rock to the westward of the north end of Deget. *Mölle Reef.*

The Holm has on its shoalest part 5 feet; the marks for it are the middle one of the above-mentioned three hillocks in one with Elling church, and Sæby church in one with the west side of Little Deget, the highest land to the westward of the fort on that island. *Holm Rock.*

On the Poulsen Reef there are several rocky heads with only 4 feet water. The marks are Apholmhouse in one with the northern part of Leerbek wood, and Sæby church a quarter of a point open to the eastward of Hiellen. *Poulsen Reef.*

108. These shoals are to be passed when proceeding from Holmhavn to Fladstrand North Road to the northward of Deget and Hiellen; and the marks for this passage are, to keep Sæby church in one with the east side of Deget, until the churchyard-gate is to the southward of Frederikshavn chapel; then steer directly for Hiellen, until this little island is in one with the castle, and then let go the anchor, 1½ cables' lengths from Hiellen, in 2 fathoms water. Easterly winds raise some sea, but the holding-ground being good, and the shoal from Deget affording some shelter, vessels may ride there in tolerable safety. If small craft proceed from Aalbek Bay to this roadstead, between the reefs above mentioned and the shore of Jutland, they ought not to approach the shore nearer than 11 feet water, and not come more to the eastward than when the two houses, situated on the highest part of the high land, still show inside of the castle. *Fladstrand North Road.*

109. Deget, Hiellen, and their surrounding reefs, separate the North from the South road. Deget is a small island, with a fort; its east side is steep-to, so that ships drawing 18 feet may approach it to 1½ cables' lengths; whereas its south and west sides are surrounded by several dangerous rocks. To the westward of Deget lies Hiellen, a little island surrounded by reefs, which extend half a cable's length off, and on which there are only from 1 to 2 feet water. Between Deget and Hiellen lies Döde Anders, a large rock above water, surrounded by a reef with only 5 feet water. Between this reef and Deget there is a narrow channel, the least depth in which is 7 feet; and between Hiellen and Döde Anders another channel will be *Deget.* *Hiellen*

found with 14 feet water, but only two-thirds of a cable wide, and more difficult to pass owing to a shoal with 11 feet water midchannel. These different channels ought to be attempted only by people intimate with their intricacies.

Speider Reef. 110. On the west side of Deget the shallow extends S. ¾ E. in a narrow ridge, on the end of which, 3 cables' lengths from Deget, lies the Speider Reef, having only one foot water on it. Two-thirds of a cable's length to the southward of *Sæl Reef.* this reef lies Sæl Reef, left dry with a common water-stand; and in the same direction, 2½ cables' lengths farther off, another, *Tre Steens Reef.* called the Tre Steens Reef, on which there are 7 feet water; and still farther out, in deep water, about 7 cables' lengths to *Marens Reef.* the southward of Deget, Marens Reef, with 12 feet water.

111. In a direction more westerly than that of these four reefs, about S.S.W., 1¼ miles off Deget, and likewise in deep water, *Borrebierg and Laurs Reefs.* there is a shoal with two rocks on it, Borrebierg on the N.W. end, with 12, and Laurs Rock to the southward with 7, feet water.

These six rocks may be considered as connected with Deget, and as forming with that island the outer range of shoals which surrounds the South Road of Fladstrand.

112. The inner range of shoals extends from Hiellen, as follows: Simons Rock, Malt Rock, Busse Rock, and Brune Rock; of which the two first carry only 1 to 2 feet water, but as they lie within *Brune Reef* the one-fathom line, they are dangerous only for boats. Busse Reef is a small rocky holm or island surrounded by shoal water of 2 to 3 feet deep, to the distance of half a cable. Part of Brune Reef is dry at low water; it lies about 6 cables' lengths E.S.E. from Fladstrand castle, and being right in the fair way to *and Beacon.* Fladstrand, it is marked by a beacon carrying one broom on a red pole in 3½ fathoms water, and bearing E.S.E. ½ E. 1160 yards from the Haven Light.

113. Between Busse and Brune Reefs there is a channel, a cable's length wide, with 12 feet water, which may admit all vessels whose draught of water allows them to pass inside of Deget. By keeping Flade church in one with the northern point of the southern battery, they will pass to the southward of Sæl Rock and Busse Rock, but to the northward of the Tre Steens and of Brune. To pass between Busse Reef and the shore, an old house named Boen, standing close to the southward of the

southern pier of Frederikshavn harbour, is to be kept well open of the rail on the stairs to the southern rampart of the castle. *Fladstrand South Road.*

114. In the innermost part of the Southern Road (the Degelöbet or channel of Deget), vessels may come to an anchor in 10 feet, clear sandy bottom, with the south point of Hirtsholm shutting with the west point of Deget, and the church in one with the house Frydenstrand. Leaving this roadstead and steering south, or a little to the eastward of Sæby church, you will pass between the reefs; and the church in one with Hygoms house is the leading mark for passing to the southward of Deget and the reefs eastward.

The common entrance to Fladstrand South Road, and the only one to be recommended to those who are not intimate with the channels hereabout, is that to the westward of Borrebierg and Brune Rock. The mark for this entrance is to bring Frederikshavn windmill close to the westward of Fladstrand castle, and to proceed on this leading mark until 3 cables' lengths off the harbour's mouth, where anchorage is found in 3 to 4 fathoms, good holding ground. The shore and shoals afford good shelter with the wind from S.W., and round to E., but all other winds raise the sea. If bound for the harbour, steer right for the castle, but be careful not to come too near the southern pier-head, before the harbour is open; sail ought not to be shortened too early, lest the ship, for want of headway, might be thrown by the sea against the northern pier-head. On the southern mole there is a signal-staff, rigged with a yard, on which signals are hoisted to guide vessels, when running for the harbour in stormy weather, or with an easterly wind, which produces a bad sea and at the same time lowers the water. *Frederikshavn Harbour.*

These signals are made by balls, about a yard in diameter and painted black:—1 ball signifies that it is impossible for a pilot to get out; 2 balls, that the depth of water in the harbour's mouth is only 12 feet; 3 balls, that it is only 11 feet; 4 balls, that it is only 10 feet. *Harbour Signals.*

Coming from the northward, the course is S.W. by S. from Hirtsholm, until Hennes house appears to the southward of the castle; then the course may be directed for the harbour, as above stated.

115. During the night bring the harbour light N.W. ½ N. and steer directly for it. This light is Fixed; it is placed on the southern pier-head, 23 feet above the level of the sea, and is of *Frederikshavn Harbour Light.*

Bangsbo Road. great use to all vessels entering. The free use of fire and candle, though under certain restrictions, is allowed in this harbour.

116. With southerly and south-easterly winds, which are the most dangerous in Fladstrand South Road, large vessels ought to come to an anchor so far to the southward as to be able to get underway and weather the Hirtsholms, and this is only to be attained by anchoring under the high land of Bangsbo, where the ground is good, with a fair sandy bottom, which gradually rises towards the beach. Large ships have also to beware of Sandhagen, a shoal sandy point, extending some distance off the beach to the southward of Bangsbo, and laid down in the chart.

Sandhagen.

117. To guide vessels to these different anchorages, or to conduct them through Læsö Rende (the channel between the island of Laesö and the coast of Jutland), to the different places on the coast of Jutland, as likewise to the Sound and the Belts, pilots are to be had from the Hirtsholms, when off their south point; and for duly making those islands, the high land of Bangsbo, and Flade church, situated farther inland, and in an elevated position, are the most convenient objects, as in tolerably clear weather they may be seen shortly after passing the Skagen. When coming from the eastward, another very high hill, Knarhöi, also called Jydske Aas, which lies farther to the southward and at some distance inland, is likewise a good landmark. Sæby church is very remarkable by its position, though having no steeple, but only a bell-tower; and finally, Fladstrand castle and Frederikshavn chapel are easily seen, as well as the lighthouse and the houses on Hirtsholm. Moreover, pilots are likewise to be procured from Frederikshavn, and also from Bangsbo.

Pilots at Hirtsholms,

at Frederikshavn and Bangsbo.

Sæby.

118. Sæby is a small town of no consequence, and though without any harbour for vessels, boats may find shelter in the rivulet. The former must remain in the roadstead, which may be approached by sounding, and in which they may anchor in a convenient depth of water, according to the size of the vessel.

At this place there is a common passage-boat to Læsö, and pilots are to be obtained for Frederikshavn, or for passing through the Læsö channel to Hals.

Pilots.

Sæby Flat.

119. To the southward of Sæby the shoal water extends farther out, with its 4-fathoms edge or limit nearly parallel to the coast, and about 3 miles off, as far as the north end of the shoals of Dvale Ground. This shoal part is called Sæby Flat, and affords

good anchorage for small vessels, with all winds off shore, having a hard sandy bottom, gradually rising towards the beach. It is separated by a narrow channel, having 23 feet water from the northern end of the Dvale Ground, which is the outermost shoal on the west side of the Læsö channel. The Dvale Ground is fully 5 miles, extending N. by E. and S. by W., with only 11 feet water at its N.W. and S.E. angles. *Dvale Ground.*

A light vessel, painted red, with a white cross and carrying two masts, has recently been placed to the eastward of the Dvale Ground. The vessel is moored in 10 fathoms E. by S. 3 cables' lengths from the middle buoy (with two brooms on it) on the eastern edge of the Dvale Ground. The light is Fixed, 30 feet above the level of the sea, and visible in all directions about 3 leagues. *Læsö Floating Light.*

120. Inside of this shoal, from the southward towards Sæby Flat, there is a channel, 2 miles wide, and 5 fathoms deep, but containing several shelves or ledges, of which, however, none carry less than 3 to 4 fathoms, except the Middel Ground, where there are only 14 feet on its shoalest part, which bears due West, one mile from the southern extremity of the Dvale Ground. To warn vessels of these shoals there are three floating beacons, on their eastern side, as laid down in the chart, viz.:—the northern beacon in 6 fathoms, off the north end of the shoal, is a red pole with one broom turned upwards; the next beacon is placed close to the eastern edge of the shoal, in 5½ fathoms—it is a pole with two brooms; the southern beacon is placed to the southward of the Dvale Ground shoals, in 4½ fathoms, and is a pole carrying a red ball—this last serves for a guide whether the intention is to pass inside or outside of the Dvale Ground. The inner channel, having much less current than the Læsö channel, and affording anchorage with a good holding ground, in 4 or 5 fathoms water, and tolerably sheltered by the adjacent shoals, is certainly in some cases to be preferred to the outer one. But, on the other hand, the channel between Sæby Flat and the Dvale Ground has only 23 feet water, is narrow and without sufficient leading marks, and is practicable only for vessels able to pass across Sæby Flat, on which in some places there are only 3 fathoms water; and even then they have to beware of the shallow water reaching off the shore, on the inside, and of the Dvale Ground, on the outside of the channel, as well as of the *Middel Ground.* *Beacons.*

Middel Ground. On the wreck of a galliot stranded of Stensnæs is placed a pole: the depth of water round, and on the wreck is 6 feet, but at one place only 2 feet.

Dvale Ground Marks. 121. The mark to pass to the northward of the Dvale Ground is Jydske Aas in one with Holdenberg. Sæby church in one with the sixth of the small hills on the high land towards Frederikshavn (counted from the church or from the southward) exactly marks the Dvale Ground; so that the church kept on either side of the said hill will lead clear inside or outside of the shoal.*

122. Between Jydske Aas and Holdenberg, but farther inland, there are three hummocks, of which the third one, counted from Jydske Aas, is to be kept just to the southward of Holdenberg, to clear the south end of the Dvale Ground, in 4 to 5 fathoms water. This line marks also the shoalest part of the Middel Ground, in 14 feet, from which place Sæby church is seen in a remarkable hollow in the high land between Sæby and Frederikshavn.

Middel Ground. Therefore, to pass to the south and westward of the shoalest part of the Middel Ground, it is necessary to be considerably to the southward of the above-stated mark for the southern extremity of the Dvale Ground, by keeping Sæby church somewhat to the eastward or to the right of the before-mentioned hollow, which seen from this southerly position appears remarkably deep. By keeping the church to the left or to the westward of the hollow until these objects appear close together, you will pass between the Dvale Ground and the Middel Ground. This last shoal being more than 3 miles long, it will not be entirely passed till you are 2 miles to the southward of the above-mentioned mark; the third hummock on the back land in one with the southern border of Holdenberg.

As well on the shoals as in the channels between them, the bottom is hard and sandy, and in some places, especially in the channels, it is covered with seaweed. Sometimes the sun gives the light gray-coloured sand on the Dvale Ground a bright hue, in which case it may be seen 2 miles off.

Læsö Channel. 123. The channel between the Dvale Ground and the shoals off Læsö is called the Læsö Rende, and is of the utmost consequence to the navigation: but it will be best described when we come to

* Views 4 and 5.

detail the shoals that form its limits. It need only here be observed, that when coming from the eastward, the Dvale Ground must not be approached within the depth of 7 fathoms; and likewise, that vessels coming from the northward have, in entering the channel, an excellent leading mark, by keeping the tower of Fladstrand castle a little to the westward of Frederikshavn chapel. Vessels may thus pass to the eastward of the Dvale Ground, and of the light vessel (Art. 119), but this mark is too distant to be seen farther than the N.W. reef, and even there not without a clear atmosphere.

Svitringen Shoals.

124. Svitringen is a very extensive shoal, being the continuance of the Middel Ground to the southward. Its southern extremity is 4 miles to the southward of Hals, where it is very narrow, and more than 9 miles distant from the shore; whereas the flat part abreast of Asaa, where it joins the Middel Ground with all its different shelves, is 6 miles across. The depth of water is very variable, commonly more than 3 fathoms, but in some places 14 feet, for which reason it ought to be avoided by large vessels. The ground consists of white sand and clay, with seaweed, but the seaweed is more frequent there than the clay. Far inside the outer edge of this shoal and of the Middel Ground lies the Rimmen, a branch of the shallow beach, which it joins abreast of Giraa, in 2 fathoms water; and from thence extends to the northward, half way between Vaarsaaby and Söraa, where its northern extremity is 2700 yards (1¾ miles) from the beach. It is nearly 5 miles in length, and carries generally from 11 to 7 feet water; but abreast of Söraa it shallows into a ridge of a mile long, and 500 yards across, on part of which there are only 4 feet water. With easterly winds the Svitringen, as well as the seaweed with which the flat and the Rimmen are partly overrun, help so much to smooth the sea, that a good anchorage is to be found inside of this last-named shoal, abreast of Söraa or of Asaa, having in the first of these places 17 to 18 feet, and in the other one 12 to 13 feet water, and good holding ground of fine red sand and clay, without rocks. The edge of the shallow bank along the beach is very abrupt, and at low water it is left dry nearly all over.

Rimmen Shoal.

Söraa and Asaa Road.

Vaarsaa.

125. To the northward of the mouth of the small rivulet, the Vaarsaa, there is a reef of rocks, having only 5½ feet water, but stretching 6 cables' lengths off shore; whereas the shallow off Söraa extends only 3 cables' lengths from the beach, and

diminishes to the southward, until abreast of Hov, where it is only 65 yards broad. In a southerly gale, which raises the sea in this roadstead, vessels may get underway, and run for shelter to Frederikshavn; and in a N.E. gale to Hals, provided their draught of water allows them to pass over the southern extremity of the Rimmen, where the depth is only 11 to 12 feet. The

Hov. anchorage off Asaa is most improperly called Asaa Harbour.

Off Hov there is no shelter whatever, but, as above stated, the shallow off the beach being there narrow, and the communication with the shore being therefore comparatively easy, when the wind blows off shore, it is usual for vessels to take in cargo there during the summer season.

Liim Fiord. 126. From that place the shallow extends a little farther off the beach, until abreast of the mouth of Liim Fiord, where it

Normanshagen stretches off 1½ miles, and ends in the shoal Normanshagen, which lies on the northern side of the entrance of that fiord, and is

Skinsæk Bay. left dry at low water. The bay to the northward of Normanshagen, formed by this shoal and the shore, is called Skinsæk.

Korsholm. To the southward of Normanshagen there is another large bank, called the Korsholm, which is dry at low water; and on it there are two beacons, called the Kaberne, to indicate the direction of the entrance, the outer beacon being distinguished by a red ball.*

Liim Fiord. Between Korsholm and Normanshagen is the entrance to Liim Fiord, which at its outer end is 3 cables' lengths across; and the outer buoy lies midchannel, in 17 feet water. Coming from the northward this buoy may be found by keeping in 4 fathoms water, until the fiord is open and the two above-mentioned beacons are in one. Coming from the southward you will have somewhat less water, but you may find the buoy by bringing Hals church to bear N.N.W., or by keeping a remarkable large farm-house, Strandegaard, between Hals and Hov (somewhat nearer the former, and distinguishable amongst the adjacent farms by having a group of lofty trees in the garden), right in the middle of the remarkable hollow of Jydske Aas. When farther in, the two Kaberne beacons are to be brought in one and they will lead to the outer buoy, where, if the signal is made, the pilots will attend.

---

* View 6.

127. This buoy, which may be passed on either side, is placed at the principal entrance, the Haa Deep; and inside of the buoy lies a bar, with only 10⅔ feet water, and 650 yards across. The beacons in one mark the shoalest part of the bar, where there are only 10 feet; but by keeping the outer beacon midway between the inner beacon on Korsholm and Mortens house on Egense Point, the least depth of water will be 10⅔ feet. The shallowest water is to be found when Strandegaard is in one with the low part of Jydske Aas. *Haa Deep.*

Owing to the narrowness of the channel, only small vessels are able to work in. The marks for 9½ feet water are:—

On the south side, the outer beacon on Korsholm in one with the northernmost battery on Egense.

On the north side, the inner beacon on Korsholm in one with Mortens house.

Inside of the bar, at the distance of 5 cables' lengths from the outer buoy, and in the direction of the beacons, the inner buoy is placed in 3 fathoms water. It is better to leave this buoy on the port side, and inside of it the depth varies from 4 to 7 fathoms.

On both sides, along the edges of the shoals, poles with brooms mark the channel as far as Hals.

The holding-ground is good, and the fiord nowhere narrower than 350 yards; consequently it is large enough for a vessel to swing round, and good anchorage is found everywhere.

128. The anchorage at Hals is commonly chosen to the westward of the quay, where vessels are not exposed to the rather short sea that sets in with S.E. winds when the ebb runs; but not too nigh the northern shore, which consists of rocky ground: a light is shown from the pier head, 32 feet above the sea. On the southern shore, near Egense battery, are still standing two old beacons, in the same direction as those on Korsholm, but as the latter may be seen farther off than the old ones, those are now of no use. The beacons used here, and named Kaberne, appear at some distance like small craft at anchor. *Hals.* *Hals Light.*

Between the Korsholm and the shallow of the beach there is a narrow channel, the Vei Deep, having 3 to 4 fathoms water; but the bar carrying only 6 to 7 feet, it thus only admits small craft. The western side of this channel is marked by poles with brooms. *Vei Deep.*

Egense Deep. Inside of Vei Deep, and separated from it by a branch of shoal ground, lies Egense Deep, a creek with from 8 to 18 feet water, on both sides of which are placed posts for mooring. This creek affords an excellent winter harbour, where vessels are out of the way of the current, and perfectly sheltered against the effects of ice, sea, and wind.

Liim Fiord Tides. 129. The tide runs pretty regularly in Liim Fiord; in moderate weather the rising of the water is about a foot at neap-tide, and 2½ feet at spring-tide: the time of high water at full and change is $8^h\ 50^m$ A.M. The mean velocity of the flood tide is one knot, but the ebb runs always faster; and in stormy weather from the southward, and with a violent current outside, it attains a rate of 4 knots. Under such circumstances the water may be 3 feet below its ordinary level; and, on the other hand, it has risen even 5 feet above the common level, when a storm has prevailed from N.W., which occasions a great influx of water; but these accidents rarely occur.

Ice. 130. The ice in either Haa Deep or Vei Deep, owing to the current, does not become very strong, and easily breaks.

Beacons removed The buoys are taken up on the 11th of November, and they are replaced as soon as the ice is gone, during which interval the Kaberne beacons must serve for guides. If the pilots are prevented by stress of weather to meet vessels at the outer buoy, the following signals with flags are made from Fort Hals:—

Harbour Signals at Hals. 131. The Danish flag signifies that a vessel drawing 10 feet may run in without any danger.

A blue flag signifies that vessels drawing 9 feet may run in.

A blue flag hoisted over the Danish colours signifies that it is dangerous to enter, even for ships with less draught of water.

When ships under these circumstances are obliged to come to an anchor in the road, the best berth is in 3½ fathoms, with Hals church or the outer buoy bearing N.N.W.

Hals Dues. 132. Every vessel, whether in or outward bound, has to pay per commerce last (about 2½ tons), for the marks along the channel, 1 rbsk. (Rigsbank skilling *); for the Kaberne beacons on Korsholm, 3 rbsk.

Every vessel of the size of more than 5 commerce lasts (about

* In November, 1850, the value of a Rigsbank skilling, silver, was ·2777 of a penny:—96 of them being equal to a Rigsbank dollar, or 2s. 2⅔d. sterling.

12 tons), fishing vessels excepted, have to pay half-pilotage, even if they do not take a pilot. Every vessel passing Egholm sand, &c., has for the marks there to give a fee of ½ rbsk. per commerce last to the pilots in Aalborg.

133. On the northern side of the estuary, 1½ miles to the westward of Hals quay, small craft may moor in Blöden, a sort of harbour formed by two ranges of piles or stakes, placed parallel to each other, in an E.N.E. and W.S.W. direction. At the four northernmost of these piles, there is a depth of 4 to 5 feet, and close to the southern ones 6 to 12 feet, but the deepest water is to be found close to the eastern piles. Between Hals and Aalborg the passage is everywhere fair, having 4½ to 8 fathoms close to the edges of the shallows off the beach, and steep-to on both sides. Abreast of Seglflod, on the shoal in 12 feet, a stick carries 3 brooms; and farther in, smaller sticks mark the channel for boats leading to Seglflod, in which there are only 1½ to 2 feet water. Three miles to the eastward of Aalborg, the shallow bank of Bredhagen is marked by 4 sticks with brooms, standing in 9 feet water, and about 650 yards asunder; and off the north side, to the eastward of Sundby, there is likewise a shallow neck, marked with 4 sticks with brooms, standing in 8 feet water, and called Sundby Hage. Off the west point of Bredhagen about the middle of the fiord, lies a shoal with 12 feet water, which extends to the westward, until Horup Church bears N.W.

Blöden Havn.

Seglflod.

Bredhagen.

From Hals the course is W. ¾ N. past Blöden; then W.N.W. and N.W., until abreast of Osteraa mill; from thence N.N.W. ½ W. and N.W by N., through that part of the fiord called Long Reach; then N. by W. bending to W.N.W., round Bredhagen, and keeping the broomsticks to port full a cable's length. Then S.W. ¾ W. is steered towards the first mark on Sundby Hage, and W. by S. along this shallow, which is to be left to starboard, and the marks kept at the above-mentioned distance.

The course is then N.W. for the new harbour of Aalborg, which has been made accessible for vessels drawing 12 feet, and therefore deep enough for all vessels that are able to cross the bar at the mouth of the fiord. N.E. by N. half a cable's length off the harbour's mouth, a buoy is placed in 7½ fathoms, to make fast to, in getting in or out of the harbour. On the

Aalborg.

N.W. side of the harbour there are quays along the whole extent of the town; off the Custom-house quay, and farther to the westward, piles are placed in from 9 to 12 feet water; and at the north-western extremity of the quay, an inner harbour was formed in 1840, with a depth of 4 to 6 feet. At the new harbour there is a yard, where vessels may be hove down and repaired. Neither candles nor fire are allowed on board the vessels in the harbour, but cook-rooms are provided on the wharf.

Sundby Ferry. On the north side of the fiord, at Nörre Sundby, a pier has been built 68 yards long, in a S.W. direction, for the convenience of the ferry, by which the fiord is crossed to Aalborg; and at its head there are 5 feet water.

134. On the coast to the southward of Liim Fiord there is a conspicuous high land, Muldbierg, with a hollow in the middle, named Dokkedal; and abreast of this hill, 2½ miles off shore, lies a rocky shoal called Muldbierg Rock, with 15 feet water round it. The shoal itself is a solid mass of rock, having 7½ feet water on its shallowest part, with several large insulated rocks, some of which are 4 feet high. It extends about 550 yards N. and S., and 410 E. and W., and is overrun with seaweed, the hue of which makes it visible at some distance.

Muldbierg Shoal.

The marks for this shoal are—1, the outer beacon on Korsholm in one with the south corner of the fifth solitary house from the northward (having trees close to it) of those seen between Hov and Hals, and two hills (the twin hills) situated farther inland in one with Dokkedal on Muldbierg; 2, the above-mentioned house in one with the hollow of Jydske Aas, and the church of Hals approaching towards the southern extremity of Jydske Aas. Along this part of the flat along the shore to the southward, the seaweed grows so high that the sea is thereby smoothed very considerably; and the holding ground being good, vessels may anchor anywhere, according to their draught of water, and ride easy, even with the wind on shore.

Hurup Road. 135. This is especially the case off Hurup, where the shoal water reaches only a cable's length off the beach, and where there is a pier, that greatly facilitates the loading or unloading of cargoes, which is such a difficult operation on this open coast. This road is frequently used as a stopping-place with contrary winds; and the best anchorage is in 14 to 15 feet, with Haslev-

gaard mill approaching towards the western part of the hill on which Als church stands. Experience has proved that vessels provided with good ground-tackle have been able to ride out the strongest gale with the wind right upon the shore; and further, that vessels ride the easiest near the shore. But of late the sea-weed has become so very thick as to render the holding ground unsafe, and now, therefore, the anchorage on the flat off Als church is to be preferred, and there vessels ride well, even with the wind blowing right upon the coast. However, at Hurup there are pilots, who direct vessels to the best anchorages, or lead them to the different places in the vicinity. *Pilots at Hurup.*

136. To the northward of Mariager Fiord, the shallows extend farther out, and S.E. ½ E. from Als church and fully a mile off shore, in 10 to 11 feet water, lies Als Reef, on the shoalest part of which there are but 2 feet for about 2 cables' lengths. To pass close to the eastward of this reef, the pilot-house in the Fiord of Mariager is to be kept in one with Dalbynedre church, and Ingerslev hill outside the southern end of Södringholm wood. Another mark to pass the reef is, to keep a solitary tree to the northward of the village of Odde, in one with Vindblæs Church. *Mariager Fiord.* *Als Reef.*

137. Mariager Fiord* falls into the sea between two banks which stretch far out, and bend in a somewhat southerly direction. The channel which leads close along the north shore is scarcely a cable's length wide, and has on the bar only 6 to 7 feet water; this depth, however, has of late been increased to 8 feet, but in a very narrow channel, along the south side of which are placed sticks with brooms. The outermost of these brooms stands on the shoal at the mouth of the inlet, in 6 feet water, and the leading mark to find it is to keep the middle one of three hills inland in one with the pilot-house, which stands on the north point of the fiord. Close to this outermost broom, and nearly on the same mark, a buoy has recently been placed. To make this mark the more conspicuous, the hill is distinguished by a pole with a barrel on the top. The narrowness, however, of the inlet, and the difficulty of avoiding the shoals, would render it imprudent to enter without a pilot. The different marks placed farther up the fiord are thus arranged. Those on the south side have brooms, and those on the north side bundles *Mariager Fiord.* *Pilots.*

* View 7.

of straw on the top of the poles or sticks. An impost of 5 rbsk. per commerce last is to be paid by all vessels whether inward or outward bound, for the marks; but only half is demanded when the vessel employs a pilot. The tides are as regular and as unimportant as those in the estuary of Liim Fiord.

Boel Reef. 138. Abreast the point near Södringholm, which separates the fiords of Mariager and Randers, is Boel Reef, but as it extends only 7 cables' lengths off shore it is not dangerous, and it is pointed out by a large rock, commonly seen above water. The depth on the flat increases gradually farther out, and 4 fathoms are not to be found within 3 miles of the shore.

Overgaard tower is discernible from 8 to 12 miles, and if kept over the middle of the wood is an excellent leading mark for the fiords of Mariager and Randers.*

Randers Fiord. 139. The town of Randers having a brisk trade has led to considerable improvements in its shallow and narrow estuary, by dredging and otherwise facilitating its difficult navigation.

Udby. The southern extremity of the estuary of Udby has a low point, extending in a northerly direction from the southern highland, and on this point there is a fortification. In the village Knedsted there is a landmark named Viften (the fan) in the vicinity of a solitary lofty tree; this mark consists of a pole 60 feet high, carrying a round board bordered with points and painted white. At some distance inland stands Raaby church, which in clear weather may be seen distinctly 12 miles; but a good mark for vessels coming from the southward is a mill with a thatched roof standing a mile to the southward of the entrance to the inlet.*

Viften in one with the middle chimney of the third house counted from the northward (the ferryman's dwelling-house), is the leading mark for the outer broom, which is placed close to the entrance of the inlet in 2 fathoms, and about a mile inside of the 4 fathoms line.

The channel from this outer mark to the anchorage at the north point of Udby, a distance of somewhat more than 2 miles, is narrow and intricate; and the abovementioned mark for making the entrance will not lead in through the narrows, which although pointed out by sticks with brooms on the sides of the channel, and by a floating beacon, ought not to be attempted

* View 7. † View 8.

without a pilot, the more so as half-pilotage is to be paid, whether the pilot is employed or not. If a signal is made, the pilot will commonly be in readiness near the outer broom; but if he is prevented by stress of weather to meet the vessel, a signal will be made from the flagstaff on Udbyhöi, indicating the depth of water in the channel, according to the same rules as at Hals, only that the signals here relate to vessels drawing 8 or 9 feet.

Udby Road. In the road the best anchorage is N.E. from the outer broom, in about 3½ fathoms. If the state of the water allows you to enter, pass to the southward of the outer broom, and steer close to the floating beacon, between the two ranges of sticks with brooms placed on the sides of the channel. The whitish flat is then visible on both sides, and the water will soon be found smooth enough to allow a vessel to anchor and wait for the pilot. The shoalest part of the entrance lies halfway between the outer broom and Udbyhöi, and has, with a common waterstand, 9½ feet water. The bar is named Kirkeground; and the mark for this shoal part is Udby church, opening to the westward of the highland. Further in, the water is deeper, and in the anchorage, from the innermost mark until abreast of Udbyhöi 4 to 5 fathoms will be found. Vessels lie here perfectly sheltered, but the holding ground is indifferent, consisting of rotten seaweed. In this place no beacon money is to be paid, but all vessels except boats are bound to pay half-pilotage, whether the pilot is employed or not.

Bar.

Pier. Abreast of the storehouse, on the north side, is built a pier, extending 150 yards in a S.S.E. ½ E. direction; at the extremity of which there are four ranges of piles, placed E. and W., and about 55 yards apart, having 9 to 10 feet water all round.

The entrance to this harbour, in which vessels may winter, is to the westward of the pier-head, and a pole is placed on the shallow part of the beach to make fast to when required.

The harbour money is 24 rbsk. per commerce last for Danish vessels, and 36 rbsk. per commerce last for foreigners.*

Mellerup. To proceed farther up the fiord it is necessary, when not familiar with its intricacies, to have a pilot. All vessels that can pass the Kirkeground may proceed to Mellerup, but only vessels drawing less than 7 feet may go alongside the quay at Randers.

* See note to Article 132.

Hevring and Fiellerup Flats.

140. To the southward of Randers Fiord, the coast extends eastward to Stauns Head. Besides the shallow bank along the shore, there are two flats, of which Hevring Flat has on its shoalest part 2 fathoms, and Fiellerup Flat, a spot with 17 feet. The holding-ground on both of those flats being good, an excellent anchorage is to be found there with south and westerly winds, and vessels may even ride out a gale blowing on shore, as the violence of the waves is somewhat abated, by their breaking on the bank and shoal of Tangen, farther to the northward.

Tangen Bank.

141. Tangen Bank is 12 miles E. and W. by 5½ miles N. and S., within the range of 4 fathoms, and has on its shoalest part 10 feet, the position of which may be seen in the chart. While Glesborg church is not to be seen to the westward of the high land between Stauns Head and Treaa Mill, the depth of water will be above 3 fathoms; with the church just opening, the least depth will be 3 fathoms, and less water will be found by degrees as the church advances more to the westward of the highland.

The channel between this shoal and the flats extending off shore, has 4, 5, and 6 fathoms water. The shallow part on the west end of the shoal, affording smooth water, allows vessels, especially small craft, to benefit thereby in stormy weather by coming to an anchor on the lee-side of the flat, in a depth of water according to the size of the vessel. The holding ground is good, being nearly all over clay and sand.

Treaa Mill.

142. Between Fiellerup Flat and Stauns Head, by the mouth of a small rivulet is Treaa Mill, abreast of which there is a good anchorage with southerly and westerly winds, in a sort of a bay, formed by two projecting sand reefs east and west of the mill, of

Skierbek Spit.

which reefs the westerly one is named Skierbek Spit, and the

Stauns Head Spit.

other Stauns Head Spit; both are nearly steep-to, but from their whitish appearance are discernible at some distance off. If the wind should change, it becomes necessary to get away in time, to be able to weather the lee-shore; for northerly and likewise S.E. winds raise a heavy swell. The bottom near the beach is rocky, and therefore vessels, especially those provided with hemp cables, should not come to in less than 4 or 5 fathoms water abreast of the mill.

143. At Stauns Head the coast bends to the S.E., forming the points or headlands, Knuds Head, Gierild Cliff, and Sangstrup

Cliff up to Forness. Along this interval, a flat extends some distance off shore, the northern extremity of which, named Gierild Flat, is separated by a narrow channel from the Tangen Bank. Its depth of water is 3 to 4 fathoms, except a small spot having only 16 feet, and at a cable's length S.W. of it, a rock, with only 7 feet water. A floating beacon is placed close to the eastward of this rock, in 3 fathoms water, carrying a red pole with a broom. *Gierild Flat.*

Knuds Head and Gierild Cliff may be closely approached, the depth of water at a cable's length off the beach being 14 to 17 feet. Off Gierild Cliff, the masthead of a foundered ketch is still visible above water. The bearings from it are: Gierild church W. ¼ N. and Foreness lighthouse S.S.W.; the depth around it 7 fathoms. *Knuds Head.* *Gierild Cliff.*

144. To the southward of the flat, Gierild Bay affords good anchorage with the winds from N.W. to S.S.W.; but with N.E. and southerly winds, the swell is considerable, owing to which, and the remarkably tough holding-ground, purchasing the anchors is often very difficult, and the numerous lost anchors are a great annoyance to vessels obliged to seek refuge there. The best anchorage is Knuds Head just shut in behind Gierild Cliff, about midway in the bay, and in 4½ fathoms on sandy clay, but more protection is afforded against N. or S. winds deeper in the bay in 3¾ fathoms, with Rimsö church in one with the southern edge of Gierild Wood. *Gierild Bay.*

From Sangstrup Cliff to Forness, the beach is so steep that at a cable's length off there are 5 fathoms. *Sangstrup Cliff.*

145. The eastern extremity of Jutland, Forness, is pretty steep towards the sea, and 26 feet high. The lighthouse erected there in 1839 shows a Revolving light; it stands 69 feet above the sea, and exhibits every half minute a bright light lasting 6 seconds, and then vanishing during 24 seconds. It is visible about 13 miles. *Forness.* *Revolving Light.*

Off Forness there is good anchorage with all winds off shore and deep water within a cable's length of the beach. There is no danger if the wind suddenly shifts round, as a vessel can always stretch off one way or the other, and the holding-ground is so good, that it is an excellent stopping place. In blowing weather from N. and N.N.E. there is good anchorage in the bay, on the south side of Forness, in 3 or 4 fathoms; but if the *Forness Anchorage.*

current, contrary to what usually happens with these winds, runs to the northward, a great swell is raised.

146. From Forness to Havknude the coast trends somewhat more westerly; the shallow extends farther off shore, and along it lie three separate shoals, viz., Kalk Ground, Naveren Reef, and Havknude Flat.

Kalk Ground. The Kalk Ground is quite insulated, there being inside of it a narrow channel, with 4 fathoms water, only a third of a cable's length from the shoal, and the shore may be approached to 2½ fathoms, but not nearer, on account of a reef, which projects some distance from the beach. The shoal itself is rocky and steep-to, nearly all round, having only 3 feet water on the shallowest part; and though the rocks are of limestone, they do not give the water a whitish hue, from their being overrun with seaweed.

To pass inside the Kalk Ground a small hillock a little to the northward of Aalsö church is to be kept in one with the northern end of the copse of Fugelsang, near the beach; and to pass outside the shoal, the same hill is to be kept in one with the southern end of that thicket.* To clear it to the eastward, keep the red-tiled roof of Hammelev church (between Grenaa and Forness) in sight above the hill near the beach; or bring Jernhatten and Havknude Points in one. Close to the S.E. extremity of this shoal there is a floating beacon, in 5 fathoms, consisting of a red pole with a broom.

Coming from the northward towards the Kalk Ground, it is necessary to go about when Grenaa church opens to the southward of the high land south of Forness. Coming from the southward, without having the mark on for passing to the eastward of the shoal, it is necessary to tack when Grenaa church is in one with the pilot's house; and if intending to pass inside the shoal, keep along the coast in 3 fathoms, until the above-stated mark for this channel is visible, and continue on this mark until Grenaa church is hidden by the high land, then shape a course round Forness.

Naveren Reef. 147. Naveren Reef likewise consists of limestone, but rising gradually it may be approached by sounding: this shoal is 7 or 8 cables' lengths to the southward of the Kalk Ground, but it is connected with the shallow beach, and carries on its shoalest

* View 9.

parts only 4 or 5 feet water, so as to be dangerous to all vessels. Abreast of Naveren lies the Puller Reef, which extends about 340 yards off the beach, and ought not to be approached nearer than in 2 fathoms. To pass to the eastward of the Naveren, the beacon at the Kalk Ground is to be kept just to the westward of Forness lighthouse. To pass to the northward of the Naveren keep Enslev church in one with Grenaa mill.* *Puller Reef.* *Mark for Naveren.*

148. The small town of Grenaa stands a mile in shore, on a rivulet that runs from Kolind Lake into the Kattegat. The harbour at the mouth of this rivulet has lately been improved by the erection of piers, and may now admit small craft not drawing more than 8 feet; thus facilitating the loading or unloading of larger vessels, which are obliged to remain in the road, where the best anchorage is in 3½ to 4 fathoms, good holding-ground, with Grenaa church seen between the small houses near the harbour.† The Kalk Ground and Naveren contribute to the shelter of the road, but at the same time they make it the more incumbent to get away in time, when the wind turns towards the shore. Pilots are to be had there. *Grenaa Harbour,* *and Road.* *Pilots.*

149. A safer stopping-place is Havknude Flat, which commences to the southward of the Puller Reef, and extends past Havknude Point. From this place it is easy to escape, either one way or the other, if the wind should suddenly veer round towards the shore. On this flat there is a single spot with only 17 feet, but over all the rest there are 3 fathoms, clear sandy bottom, and close up to the beach. *Havknude Flat.*

Here as well as in Grenaa Road, S.W. winds occasion a swell, which soon rises to a great height, especially if the wind draws more southerly; and this ought to be remembered so as to purchase the anchor while it is possible to do so.

150. From Havknude to Jernhatten, a remarkable promontory, the coast trends more to the westward, and the shallow water extends only a short distance off the shore, which close to the northward of Rugaard is somewhat foul, a 10 feet patch being close to the northward of the fisherman's house; and farther to the southward Rothe Ground, an insulated sand-bank, with some rocks, and only 9 feet on its highest part. To pass to the eastward of it, a single thorn-bush between two hills on the ridge *Jernhatten.* *Rugaard.* *Rothe Shoal.*

* View 10.

† The bottom being foul farther out.

of the coast is to be kept in one with the Godsdalsgaard, the farm nearest the beach, as likewise the dwelling-house of the estate of Rugaard must be seen open of the wood.

Jessen Shoal.

151. Farther to the southward on this part of the coast, the shoal water is inconsiderable, but Jessen Ground requires attention; it lies abreast of Arnkile Wood, nearly a mile off shore, and, though a spot of small circumference, has only 9 feet water. Between it and the beach there is a 4 fathoms channel, in the middle of which, however, there is one patch with 3½ fathoms only. No good leading mark offers itself for this channel, and it is therefore only to be used by those intimate with the locality, or at all events by small craft. At the eastern edge of the Jessen Ground, in 4 or 5 fathoms water, there is a floating beacon, with a red pole and two brooms. The mark to pass outside of all, is Draaby church, open to the southward of Jernhatten; and when abreast of the shoal, the middle one of three remarkable hills is in one with the huntsman's house, at Rugaard, situated on the sloping ground to the northward of Arnkile wood.*

When beating up inside of this shoal, observe that the above middle hill ought not to come in sight over the sloping ground, but vessels should tack as soon as the outermost hill is visible. Off the huntsman's house there is good anchorage in 3 to 3½ fathoms on a clean sandy bottom, with Elsgaarde cliff just open of the sandy point outside the wood; but farther out there are rocks in 4 to 5 fathoms.

Havmöllen.

152. The bay to the westward of Jernhatten, abreast of Havmöllen, offers an excellent stopping place, with all winds from S.W. to N., but if the wind veers to the eastward of N., it becomes necessary to get away immediately. In entering this bay from the northward do not round-to before Jernhatten bears N.N.E.,

Blak Rock.

to avoid the rock called Blak, a cable's length from the beach, and with a common waterstand just visible above water. Farther in the bay, between Holme and Draaby, lies the Holme Stone

Holme Stone.

with 3 feet water, though it sometimes uncovers with a very low waterstand. It is 1½ cables' lengths from the beach, in 2 fathoms. From that rock, the easternmost farmhouse only is

---

* See Views 11 and 12.

visible above the shore, the rest of the village being hidden behind the brink.

153. In the bay to the southward of Jernhatten, the shoal water does not extend far off, till abreast of Hasenöre, where it enlargens and forms the extensive Öre Flat, on the eastern side of which there is a small rocky shoal, called the Klokke Ground, with 7½ feet water. The mark to pass two-thirds of a mile to the eastward of this shoal is to bring a lonely farmhouse, at the western end of the village of Holme, twice its own length, outside of the high land to the southward of this village, and at the same time the southernmost of two small hillocks, on the southern extremity of Hasenöre, in one with a small hillock, a short distance to the northward of three conspicuous hills, named Dyrehöien, which stand close together on Mols land, to the westward of Ebeltofte Bay. A farmhouse in the vicinity of Draaby church should likewise be brought just to the edge of the high land, close to the southward of Elsgaarde. Another mark, instead of the distant house near Holme village, is to keep the northernmost of two lonely houses, which will be seen on the beach in Boeslum Bay, just in one with the high land south of these houses; but this mark, which is nearly at all times visible, leads about a quarter of the breadth of the channel to the eastward of the shoal. A floating beacon has been placed about 70 yards S.E. from the shoal in 29 feet water, carrying a red pole and a broom. Close inside of the Klokke Ground there are 4 fathoms water, gradually shoaling towards the beach; but to the southward and eastward, the depth suddenly increases to 10 fathoms. Close to the eastward of the Klokke Ground, and separated from it by a very narrow channel, with 4 fathoms, there lies a small bank, carrying 17 feet water over some large stones, and being only 30 to 35 yards across each way; the cross mark for which is the top of Skielhöi in one with the northern edge of Elsgaarde Wood. To pass to the eastward of the bank, keep the floating beacon on the Klokke Ground, the apparent breadth of Samsö to the westward of that island. When the Dyrehöien are to the southward of the extremity of Hasenöre, you are past the Klokke Ground.

Hasenöre Head.

Öre Flat and Klokke Ground.

Rocky Bank.

154. Nearly 2 miles S.S.W. from the Klokke Ground and to the eastward of the Öre Flat, lies a ridge of rocks in 15 feet water, extending from N.W. to S.E. about 300 yards, and about 70 yards

Detached Shoal with 15 feet.

wide. It is rather steep-to on all sides, rising abruptly from a depth of 4 or 5 fathoms, and from its shoalest part the top of Hielm Island being just in one with a little hut standing at the foot of the hill, while the Klokke Ground beacon bears N.N.E.

There is no good leading mark to avoid this shoal; but by keeping the Klokke Ground beacon to the northward of N. by E. a vessel will clear it to the eastward; and to the westward by keeping the beacon to the eastward of N.E. ½ E. When the top of Hielm bears E.N.E. ½ E., and is seen to the southward of the hut, you are well to the southward of the shoal.

Hielm Island. 155. The small island of Hielm is a high and conspicuous hillock 133 feet above the level of the sea, surrounded by a sandflat, except off its S.W. point, which may be approached within a cable's length. On all parts of the flat there is anchorage, but the best is on the north-west side, as the south and north-east *Klör Grounds.* sides are foul. The Klör Grounds are two small rocky patches with only 7 feet water, and extend a mile to the southward of Hielm, the top of that island bearing N. by E. ½ E.; and Carlsberg, a conspicuous round hill to the northward of Boeslum shut a little in upon the low south-west point of Hielm. Another shoal bears N.E. ½ E. from this one, at the distance of about half a mile.

Rocky Patch. On the north-east side of Hielm there is likewise a heap of rocks carrying only 5 feet, and therefore during the night do not approach the island nearer than 7 fathoms, which depth leads outside its flat and its dangers.

To the northward of Hielm, from 2 to 4 miles, there are three different insulated rocks; the middle one of these has 15, and the others 21 and 22 feet, over them; and being surrounded by a considerable depth of water, and without distinct marks to avoid them, larger vessels ought not to approach the island within 4 miles. As a general rule for passing to the northward of those shoals, keep Skielhöien (a hill near Ebeltofte, and remarkable by its two small hummocks) W. by N.; and you will be abreast of the shoals when two small hills a little to the northward of Hasenöre are nearly in one with Ellemandsbierg; or when the southern extremity of Helgenæs is seen halfway between the lofty hill Ellemandsbierg and Hasenöre. To clear them to the westward, approach the shore within a mile, and when past the shoals, steer towards Hielm Island to

avoid the Klokke Ground. This is the more necessary as it is said that a vessel, in October 1837, struck on a rock in 15 feet water, about 4 miles to the north-west of Hielm, but the circumstance is doubtful.

156. As shown in the chart, there is to the southward of Hielm Island, a shoal or flat to be avoided by large vessels, called the Mosel Ground, having generally 20, but in one spot in the middle only 13 feet water, and in another 18 feet. To pass it to the eastward, do not bring Verö Island to bear more southerly than S.W., until Rugaard Wood is seen close to the eastward of Hielm Island; or until Ellemandsbierg bears N.W. ½ W. The conspicuous knoll of Jernhatten, open to the westward of the low south-west point of Hielm, leads to the westward of the Mosel Ground, and to the eastward of the flat with 18 feet; and when coming from the northward, you may keep this mark, until the Dyrehöien hills are in one with the south end of Hasenöre. *Mosel Ground.*

It must be remembered that the current commonly runs with great velocity between Hielm and the shore. *Current.*

157. The large Öre Flat, extending off Hasenöre Head, after passing the Klokke Ground, may be easily approached by the lead in a convenient depth. Its shallow water, of 2 to 3½ fathoms, and its excellent holding-ground, render it a remarkably good stopping place, and it is therefore resorted to by numerous coasters, which by the darkness of the night, or foggy weather, or contrary winds and currents, are prevented from proceeding through Thunö Channel, or from weathering the Skade Ground. Should a vessel's draught be too great to pass over this Flat, she must keep along its eastern side by the lead, minding not to bring the Klokke Ground beacon to the northward of N.E. ½ N. *Öre Flat.*

158. To the west and southward of the Öre Flat, there is another bank with a similar depth, and between them there is a narrow channel with 3 to 4 fathoms, but being destitute of good leading marks, vessels should pass to the westward of both, if they intend to enter Ebeltofte Bay. The only danger here is the Skade Ground, which on its shoalest rocks has only 5 to 6 feet water. The marks for this shallow part are, a farm-house on the lowest part of the shore to the S.E. of Ellemandsbierg, in one with the northern end of the foot of that mountain; and Bögebierg, a hill in the vicinity of Ebeltofte, in one with the *Skade Ground.*

southern part of a wood likewise near this town. But the whole shoal is cleared to the eastward by keeping Bögebierg in sight outside of Ebeltofte Wood, and to the westward by bringing Skielhöien in one with the eastern border of the same wood. To clear it to the southward, keep Marsillisborg Wood (near Aarhuus) open to the southward of Sletterhage Point; and to pass to the northward of it, keep Ellemandsbierg close to the northward of the white cliffs of Helgenæs.*

The Skade Ground is dangerous to vessels of any size, and ought not to be approached on its W., S. and E. sides, nearer than in 10 fathoms, from which the water very suddenly shoalens to 7, 4, and 2 fathoms; but to the N.E. of the shoal there is a prolonged flat, with 2 to 3 fathoms, which small craft may cross by paying due attention to the marks; for, while the above-mentioned farm-house is in one with Ellemandsbierg for the whole extent of that hill, you will have rocky ground in 11 or 12 feet water; but this rocky part is narrow, and it is only at its S.W. extremity that there are but 5 feet water, which shoal part is more than 1½ miles from the beach of Helgenæs. A floating beacon carrying a red pole and a broom, is placed in 20 feet water, about a cable's length S. by W. from the middle of the shoal.

Ebeltofte Bay. 159. To enter Ebeltofte Bay, large vessels may pass to the westward of the Skade Ground by keeping the whole of Bögebierg in one with Ebeltofte Wood, and by sounding in order to avoid the not extensive flat off Luushage. In gales from N.W. and N.N.W. good anchorage is to be found between Sletterhage and Luushage Points. And any sized ship may pass to the eastward of the Skade Ground, by keeping Bögebierg about its own height to the southward of the wood, until Ellemandsbierg bears N.W. by N.

Alhagen Shoal. 160. A large shoal projects from Alhagen, but its white sandy bottom gives such a bright hue to the water that it is visible from the deck of any vessel; off its N.W. end, a beacon with one broom is placed in 14 feet. When all Ebeltofte town is seen to the northward of Alhagen Point, the depth close along the shallow is 6 or 7 fathoms; and when Lyngsbek Wood bears N.N.E., and the court-house (a yellow building in the centre of the

* View 13.

town) is in one with Skielhöien, you are at its extremity, and may steer E.S.E. along its northern edge, but taking care to avoid a point of the flat that projects to the northward. To the eastward of this flat, two patches have only 6 feet water; they lie N.W. of the town, and the best anchorage is outside these shoals on the Pilken, when Luushage Point nearly shuts with Alhagen, and the spire of the old court-house, being the northernmost in the town, is in one with Skielhöien. There you will find 4½ fathoms and good holding-ground, whereas the bottom in all other parts of the bay is greatly encumbered by rotten seaweed. Farther in, there is good anchorage in 2½ fathoms, with the steeple of the court-house in one with Skielhöien. Large vessels may anchor more to the westward and northward, and outside the sand flat, in the western parts of the bay, where there is a deep water channel with 6 to 8 fathoms. To enter this channel, ships have to avoid a bank of two shallows with 3 fathoms water, situated more than a mile S.E. of the low land that connects Helgenæs with Mols Land. *Patches.* *Anchorage.*

161. Vessels not drawing more than 9 feet may pass between the sand-flat and the patches, by keeping the straw-thatched houses in the southern part of Ebeltofte open of the pier-head; and they can anchor to the southward of the shoals in 10 or 12 feet water, about 2 cables' lengths from the pier-head, when the church is in one with Skielhöien. In the harbour inside the pier a depth of 10 feet will be found, and vessels are allowed to light candles and to cook on board. When beating in, the mark for tacking, if standing to the southward, is the court-house spire in one with Skielhöien: and if standing to the northward (to clear the shoals of Laaden Head, a promontory covered with copse) when Skielhöien is approaching the windmill at the northern end of the town. *Ebeltofte Harbour.*

Pilots are in readiness if required by signal. *Pilots.*

162. The bay of Begtrup is an excellent harbour, with northerly, easterly, and even with southerly winds, whereas westerly, and particularly south-westerly winds, occasion a considerable sea, which however may be avoided by anchoring in the interior part of the creek, under the Helgenæs shore, in 7 to 8 fathoms, and even less. Vessels are sheltered there by the Rönnen shoals, and lie nearly land-locked. It ought, however, to be observed, that the holding-ground in this creek, where the depth is more *Begtrup Bay.*

than 4 fathoms, is less good, the bottom being overrun with seaweed.

Rönnen. 163. The Rönnen is a heap of rocks, nearly dry; small craft may run in behind them until the outermost rocks shut with the shoulder of Helgenæs, where they may anchor in 2½ to 3 fathoms, with a clean sandy bottom, and perfectly land-locked. S.W. storms, however, occasion some swell, which may make this anchorage dangerous. To the westward of the Rönnen there is a pretty large sandy flat, on which vessels may find good anchorage, with south and east winds. At the western side of the bay, under Mols Land, vessels will find shelter, in 5 or 6 fathoms, from westerly winds. Nearly in the middle of the entrance of Begtrup Bay there is a 3 fathoms shoal, and in coasting along the Helgenæs shore with an intention to enter Begtrup Bay, care must also be taken to avoid the shallow water that extends half a mile from its north-western extremity, and close to which there are 11 fathoms.

Kalö Bay. 164. In Kalö Vig, or Bay, ships of any size may find a safe refuge against all winds. In entering, the principal care to be taken is to avoid the projecting shallows off Skiöds Head; to effect which, keep a remarkable hill, behind Marsillisborg Wood, right over the valley in which stands the mill. With thick or hazy weather, when this mark cannot be seen, the creek may be entered by steering boldly a little to the westward of Skiöds Head, until the whitish shallow to the northward of it is seen; and this shallow, with its 1 or 2 feet water, being steep-to, may be taken quite close. When past it, steer for the northern side of the bay, where there is perfectly safe anchorage in 5 fathoms. In the interior part of the bay, the holding-ground is not so good, consisting of rotten seaweed; but it is tolerable off Lygte, in its northern angle, where vessels lie sheltered from the S.W. wind, the only one that occasions any sea.

Egens Vig. In Egens Cove, the N.E. creek of Kalö Bay, the holding-ground is so bad that the anchors do not hold in stormy weather, notwithstanding its being sheltered by the Rönnen. There are two ways into Egens Cove, the one close under Kalö, with 2 fathoms water, and very narrow; the other has 4 fathoms between the Rönnen and the opposite shore. The depth of water in the northern part of Kalö, is 4 to 6 fathoms.

On the south-east side of Kalö Bay, the remarkable creek of

Knebel Vig forms a basin, perfectly land-locked, with from 4 to 7 fathoms, and an entrance of only half a cable's length across. The bottom is soft clay, and tolerably good, but the anchor is sometimes prevented from taking hold by the seaweed, which is abundant. *Knebel Bay.*

The narrowness of the entrance, and the shoals outside, require an exact attention to the following marks :—

On the western shore of Kalö Bay, between the villages Studstrup and Alstrup, there is a remarkable hillock near the beach; and Skiödstrup church must be brought in one with the easternmost white spot on this hillock, bearing N.W.; keep to this mark until Tveed church is in one with the low point off Ege Head, then steer for this headland, about S. by W., till Skiödstrup church is in one with the low part of the above-mentioned hillock, that is, about N.W. ¼ N. This mark leads directly to Knebel church, and must be exactly followed till through the narrows. Then steer direct for Vistoft church, which will be seen to the eastward of a hill near the beach; and anchor between Ege Head and Tveed church; recollecting that shoal water extends very far off the beach, everywhere in this harbour, though least on the eastern side.

165. The bay formed by Jutland, Samsö, and Thunö, called Aarhuus Bay, has two harbours, Aarhuus and Norsminde, besides the before-mentioned creeks, adjacent to the bay. In its principal entrance, formed by the island of Samsö and Helgenæs peninsula, lies the Middel Flat, stretching east and west 3½ miles, and having at each end a dangerous shoal, viz., at the western and broadest part, the Middel Ground, which is a narrow dry ledge of sand, in the form of a long S, a third of a mile long, and 2 to 3 feet above water, as it seldom covers, except in hard easterly gales. On the north and west sides it may be approached pretty near, but on the east side there is less water, and on the south-east side a neck of sand, with less than 2 fathoms, extends for a third of a mile; the 4 fathoms line of soundings lying nearly a mile from the bank. *Aarhuus Bay.* *Middel Flat.* *Middel Ground.*

The eastern end of the flat forms a dangerous reef called the Lille Ground, consisting of large rocks carrying 4 to 6 feet water, and stretching from N.W. to S.E., about 130 yards long, and 27 yards across. Close to the eastward of the shoal there are some rocks with only 13 feet water; at the eastern *Lille Ground.*

Beacon. side of which there lies a floating beacon, with a chequered pole and a red ball standing in 29 feet water, the marks for which are, a conspicuous path or track in Lyngsbek Wood, kept well open to the eastward of Helgenæs Point, and the top of a remarkable cliff on Helgenæs in one with Ellemandsbierg. This steep shoal may be plainly seen, not only in gales of wind, when the sea breaks on it, but sometimes in fine weather, at the distance of a cable's length, by the brownish hue of the water.

Clearing Mark. The mark to pass to the eastward of this shoal is, to keep the western edge of Lyngsbek Wood, in one with the eastern side of Helgenæs peninsula. The eastern edge of the wood in one with that line of the coast, leads right on the shoal, when the Kyholm lighthouse shows nearly half way between Isse Head and Værö.*

As a stopping place, anchorage may be found on the Middel Flat, the bottom being sand and grass, and the Middel Ground may afford shelter against westerly winds. With the latter, large vessels drawing too much water to enter Norsminde Harbour, might find anchorage to the westward of the bank, though not hitherto frequented. W. by S. full 2 miles from the Lille Ground beacon, and 3 miles N.E. from Isse Head, there is a patch with 22 feet over it, and 4 to 6 fathoms to the eastward of it, while at 970 yards to the westward there are 11 fathoms.

166. N.N.W. ¼ W., 2¼ miles off the Middel Ground is Wulffs *Wulffs Flat.* Flat, consisting of hard sand and grass, having 3 fathoms on its shoalest part; but the whole extent of this bank is 2 cables' lengths only, in a N.W. and S.E. direction. All around it the bottom is soft, and so steep that at the distance of 1½ cables' lengths on the west side there are 5 fathoms, on the north and east sides 6 to 7, and to the southward 8 or 9 fathoms.

Ellemandsbierg, kept to the northward or to the southward of a whitish cliff to the westward of the mountain, leads to the northward or to the southward of the flat.

Ryes Flat. Between Egaa and Riis Wood lies Ryes Flat with 12 feet on its shoalest part, of which a vessel should be careful when sailing into Kalö Bay, or in beating into Aarhuus Road. To pass to the eastward of this flat, keep the conspicuous hill above Marsillisborg Wood in one with the white house near the beach, called Varna. Coming from the southward, do not approach nearer

* View 14.

than where Veilby church comes in one with the thatched house on the beach, north of Riis Wood N. by W. ¾ W., and to go to the northward of the shoal, keep Veilby church in one with the north edge of the northern plantation between Riis Wood and Egaa. Between this shoal and the shallow water there is a clear channel with 4, 5 to 6 fathoms, the leading mark through which is, to keep the above-mentioned conspicuous hill behind Marsillisborg Wood, to the eastward of the thicket on the beach running from the wood to the southward of Aarhuus.

167. Aarhuus Harbour is formed at the mouth of a rivulet, from which two piers have been projected, one of them running out to the depth of 17 feet; and inside of these piers, vessels not drawing more than 9 feet may be admitted into the inner harbour, but the entrance being intricate and narrow, a pilot is necessary. The harbour has been lately considerably improved by the construction of an outer harbour, which will admit a draught of 14 feet. To guide vessels during the night, a lamp 34 feet high, has been placed on the southern pier-head, and is visible 8 or 9 miles. Large vessels must remain in the road where the depth is 4 fathoms about 6 cables' lengths off the pier-head: the bottom is coarse sand, the holding-ground is best to the northward of the pier-head, and the mark for the anchorage is, to keep the steeple of the cathedral right between the small towers on the church, until the huntsman's house, to the southward of the town, is seen close outside the pier-head; the depth of water will then be 3 fathoms. *Aarhuus Harbour.* *Light,* *and Road.*

Vessels ought not to come to an anchor more southerly than on the above mark; the road to Marsillisborg being open. Gales, especially from the S.E., occasion so heavy a sea, that small craft must seek refuge either in the harbour or in Kalö Bay. If anchors or chains should give way, so that to run the ship ashore becomes inevitable, steer for the northern extremity of the town, where the bottom is perfectly clean, and where vessels have been frequently beached without being hurt.

Steam vessels only are allowed to have fire on board, while in the harbour.

At Aarhuus there are no regular pilots, but the brothers Litsen will assist any vessel which shows a pilot flag. *Pilots.*

168. To the southward of Aarhuus, the shallow along the beach is perfectly clear, as far as Norsminde, where a harbour is formed *Norsminde Harbour.*

in a small bay, by two projecting sands, the northernmost called Hesbierg Ground, and the southern one Kysing Hage. This harbour is well sheltered by Norsminde Flat, which is more than 2 miles long, and 6 cables' lengths across, and having on its shoalest part 12 feet water. To the northward of this is another flat with 19 feet, both of which, owing to their white sandy bottom, may be discerned sufficiently far off. Norsminde Flat is separated from Hesbierg and Kysing by narrow channels, with 5 or 6 fathoms water, except one spot in the southern channel (which is the largest), and where there are but 19 feet. In the harbour there are from 4 to 5 fathoms with good ground, though overrun with seaweed; it is well sheltered, as above stated, against all winds, even easterly ones, the sea being broken on the flat outside, but the heavy swell that accompanies N.E. gales may sometimes trouble small craft. Notwithstanding this inconvenience, Norsminde Harbour is a valuable refuge for all vessels meeting heavy gales of easterly winds in the bay of Aarhuus; from Sletterhage, the southern extremity of Helgenæs a course may be steered directly for this harbour.

Norsminde Flat.

Hesbierg Ground.

On Hesbierg Ground and Kysing Flat there are rocks carrying 8 feet water, and with 2 fathoms around them. The mark for that on Hesbierg shoal is Sconce Hill, which is close to the southward of Aarhuus, and just visible outside of Abelshoved, near Moesgaard. A cable's length near the shore, and a little to the northward of the point, there has been found another rock, with 8 feet, but farther in there are 10 feet. A leading mark to enter this harbour is a beacon, consisting of a pole carrying a white barrel on the small island of Kalö, in the lake inside the bridge across the estuary, and near an inn; this beacon is to be kept in one with the middle of the bridge. Vessels ought not to proceed farther in than the west point of Thunö, being in one with the point of Kysing Hage, and then drop the anchor in 3 or 4 fathoms. In going out of the harbour, and bound southward, you may stand across the flat of Kysing Hage, when Dyret, a high hill on the southern part of Samsö Island is just visible outside, to the westward of Thunö.

Every vessel entering the harbour has to pay 2 Rigsbank-mark (9*d.*) beacon money.

From Kysing, farther to the southward in the bay, there is

good anchorage along the beach, towards which the water gradually shoals till near Dyngby Head, from whence a series of flats and shoals, with deep-water channels between them, extend to Thunö. These flats and shoals may be considered as forming the southern limits of Aarhuus Bay, and are from west to east as follows:—Dyngby Hage, Löse Flat, the Knob, and Thunö with its appurtenant banks.

169. Dyngby Hage is a flat or shallow extending E.N.E. fully a mile off Dyngby Head, with only 11 feet water; at a third of a mile, and close to its outer point, there is a spot with 15 feet. To pass mid-channel between it and Löse Flat, keep the northern part of the cliff in the vicinity of Riis Wood (near Aarhuus) in one with Kysing Hage, until the northern shore of Thunö is in one with the south end of the highest part of the Nordby land of Samsö, or nearly halfway between Isse Head and Asmör Hage, then you are to the southward of Löse Flat. The common depth in this channel is from 5 to 8 fathoms, except in two places of small extent, where there are but 22 feet. *Dyngby Hage.*

170. Löse Flat is 2 miles from N. to S., and the shallowest places are on its two extremities; the northern having 13, and the other 11 feet water. The bottom is white sand, which gives to the water a whitish hue, by which the shallows may be discerned, but on these sand flats there is much seaweed. *Löse Flat.*

171. Between this flat and the dry sand-bank, called the Knob, there is a channel with 7 fathoms except on a single spot, where the depth is only 3 fathoms, but the channel is only half a mile across. The Knob is a large, and nearly round shoal to the westward of Thunö Island; a ridge along its southern side is dry for the length of a mile, and forms a crescent, with the horns turned to the northward, from both of which shallows extend to the northward. On the south side, the water gradually deepens from the dry ledge; the bottom is clean all over. *Knob.*

The channel between the Knob and Thunö is about 680 yards across, with from 6 to 14 fathoms water. Owing to the flat which extends off the N.E. spit of the Knob, it is difficult to pass through this channel, but it may be done by paying attention to the following directions:—

Coming from the southward, steer towards the west end of Thunö until close to the whitish water off the beach, and run along this until a white cliff on the lower part of the high land

of Samsö is seen well to the northward of Thunö, or until Asmör Hage becomes visible to the northward of the east point of Thunö, then the flat is passed and the passage westward open. On the contrary, when coming from the northward, keep so far to the eastward that the southern part of Samsö does not become visible to the westward of Thunö, which mark leads across the N.E. flat in 3 fathoms, then steer for the front of the island until the whitish-looking shallow along the beach is plainly visible, and then pass through the channel by steering directly for Endelave mill, which will lead through, and to the westward of the Kirke Ground. The better to avoid the N.E. flat in coming from the northward, keep rather more to the eastward than the above-mentioned mark; and when you are past the N.E. flat, remarkable by its whitish hue, and getting in 4 to 5 fathoms, steer a little outside the west point of Thunö, in order to avoid the N.W. spit of Thunö, it being steep-to and having in most places a dark hue, as the bottom is stone and seaweed.

Thunö. 172. Thunö is surrounded by shallows which afford good anchorage except off the east end, where a narrow ledge of sand called the Rönnen runs off half a mile. It is nearly dry, and steep-to at its termination, where it drops into 7 fathoms, and may therefore be taken quite close; as may likewise the southern face of the ledge, when the intention is to come to an anchor on the S.E. flat. On this flat, where the bottom is sand, but good holding-ground, the best anchorage is abreast of the mill, in 3 to 5 fathoms, according to the vessels' size, where they are well sheltered against all northerly winds. Inside the depth of 2½ fathoms, the bottom is foul, and off the S.E. point of the island a reef extends 3 cables' lengths, in a southerly direction, having at its end only 10 feet, whereas farther in, about a cable's length from the beach, the depth is from 12 to 14 feet. Close to the beach, abreast of the village, there is a reef, and it is reported that there is a detached rock outside the flat, but it has not yet been found; and also about S.S.W. 6 cables' lengths from the lighthouse lies a small rocky patch with less than 7 feet on it in a depth of 2 fathoms.

Beacon. On the low west point of the island, a pyramidal heap or stones has been erected, and called Steenkarlen; abreast of this the anchorage is indifferent; but in other places 2½ to 4 fathoms with good holding-ground may be found, well sheltered against

all northerly winds. Vessels ought not to anchor in deeper water than 5 fathoms, as outside of 6 fathoms the depth very suddenly increases to 9, 10, and 11 fathoms.

Along the north shore of the island, there is likewise good anchorage, especially abreast of the east point, on the extensive N.E. flat, where vessels during the summer season may ride out even a northerly gale, the holding-ground being so good. The best mark for anchoring is to bring the church in one with the middle of the eastern cliff, and proceeding on this line till Asmör Hage is visible inside of Rönnen, which will give shelter from the S.E.; then drop the anchor in 3 fathoms. Off the N.W. cliff there is also good anchorage, but near in, there are several rocks, one of which lies in 2 fathoms, abreast the east end of this cliff, about two-thirds of a cable's length off the shore, and carries only 4 feet water. Vessels, therefore, ought not to anchor nearer the shore than in 3 fathoms. From the N.W. cliff, a reef runs half a cable's length out, with only 10 feet water at its extremity.

On Thunö church-tower there is a Fixed light, 100 feet above the level of the sea, and visible 15 miles distant. *Thuno Light.*

The pilots of Thunö take vessels to all places in the vicinity southward and westward, as likewise along the coast to the northward, and are paid certain regulated fees; whereas, if they are wanted to pass Samsö and Hielmen, an agreement must be made. *Pilots.*

173. A mile and a half W.S.W. of Thunö lies the Kirke Ground, about 3 cables in length N. and S., and 5 E. and W., and carrying 12 feet water on its shoalest part. To pass to the eastward of this shoal, keep Isse Head open of the east point of Thunö; and when Besser church, on Samsö, becomes visible to the southward of the remarkable hillock close by the church, you are to the southward of the shoal; as you are to the northward of it when the church is open to the northward of the hillock; and this latter mark leads between the Kirke Ground and Thunö, in 14 fathoms. The shoal is passed to the westward by keeping Ellemandsbierg open to the westward of Thunö. The Kirke Ground consists of whitish sand and seaweed, and has of course a whitish hue with dark spots. *Kirke Ground.*

174. From Dyngby Head southward to Hov Huk, or point, the shallow does not extend far off the beach, whereas between that point and Söby Hage there is an extensive range of shoals, *Dyngby Head.*

Söby Hage. called Söby Reef, Sö Ground, and Svane Ground, which unite with the shoals of Endelave. Abreast of Hov Huk lies the Hov Rön, separated from the in-shore shallows by a very narrow

Hov Rön Shoal channel, and surrounded by an extensive flat. The Hov Rön shoal has only from 1 to 2 feet water, with numerous rocks and much seaweed, most of which may be seen. Owing to the sandy bottom, the colour of the water on the flat is whitish. On its western side the Rön is steep-to; and the channel, which is not more than two-thirds of a cable's length across, has 5 to 6 fathoms water, except at its southern end, where the depth is only 22 feet. For this narrow channel, which has besides an easterly bend in passing Söby Reef, no leading mark can possibly be given, nor any other directions than to keep close to the shoal or Rön, which will be plainly indicated by its whitish

Hov Havn. water. Through this channel small craft may enter Hov Havn where the depth is 7 to 10 feet, close to the southward of Hov Huk, and where vessels lie well sheltered against all winds, except from the N.E., which occasions some swell. The holding-ground is excellent, sand, with clay underneath; and in a single place, of small circumference, close to the shallow of the beach the depth is even 2 to 3 fathoms. Off Hov Huk there is a small reef, with only a foot water. The mark to enter Hov Havn is to keep Dyngby mill in one with the edge of the wood.

Söby Reef. 175. Söby Reef projects from the shore about 1¼ miles, and reaches along the beach from Hov Huk to Söby Hage, about the same distance. It carries only a foot or two water, and

Sö Ground. several of its rocks show above water. The surrounding flat has 6 or 7 feet water, but with many small rocks, and is called the Sö Ground, between which and Söby Reef there is a passage of a third of a mile across, with 11 feet. On the western side of the flat, with the following mark, the western edge of the wood on As Head in one with Gylling Ness, there are shallows with only 2¼ feet, but this depth soon increases to 2 fathoms, or 11 feet, being the least water in this western passage. The white-looking water on the shallows is visible on both sides of this channel.

Sö Ground Channel. Outside of the Sö Ground, between it and the Svane Ground, there is a fair and much-frequented channel, with 11 to 12 feet and leading across the flat, and immediately inside of the Svane Ground, which is extensive and partially dry. This passage is very often resorted to by the coasters as a stopping-place. The

mark for the passage is, the east end of Æbelö just open to the westward of Kloben Point (on Endelave Island); and two floating beacons in 2 fathoms mark the channel, viz., a buoy with a red staff and ball on the Sö Ground, and one carrying a white staff and 2 brooms on the N.W. point of the Svane Ground. *Buoys.*

A fee of 1 rbsk. per commerce last is to be paid by every passing vessel to the Endelave pilot, who attends the buoys. This pilot is able to take vessels to the different places in the neighbourhood. *Pilot.*

176. The Svane Ground gradually shoals towards its dry part, and may therefore be approached by the lead, though on the east and south-east sides the slope is pretty quick. Nearly all over the flat the bottom is sand, but in some places stones lie in heaps, with but little water over them. *Svane Ground.*

177. The channel between the flat of Svane Ground and Ringebierg Sand, off Samsö Island, is very deep, in the middle even 22 fathoms. The mark to pass to the eastward of the Svane Ground is, to bring the eastern side of Helgenæs nearly to touch Kolsör Hage (on Samsö), and this mark likewise just clears the outer extremity of Ringebierg Sand. The Svane Ground is passed to the northward by keeping Biergelide in one with Gylling Ness, until Æbelö comes in one with Endelave, the leading mark, as before mentioned, to pass across the flats. *Samsö Channel.*

On its south side, the Svane Ground is connected by a neck to the point of a shallow projecting from the north end of Endelave; but across the intermediate flat there is a channel for vessels drawing 16 to 18 feet. To enter the Samsö Channel from the eastward, which in many circumstances may be convenient, keep so far to the southward as not to borrow on the Svane Ground nearer than in 4 fathoms, then steer N.W. or W.N.W., until the depth of water, in approaching the north end of Endelave, Overst Point, is 3 or 4 fathoms. If Alrö church is then visible, the course is to be directed in such a manner as to bring it in one with Gylling Ness, before the copse near Overst Point is in one with the wood on the S.E. end of Endelave Island, at which time you will be abreast of the shoal, with only 4 to 7 feet water; whereas if Alrö church is not to be seen in coming along the eastern side of Endelave, bring that part of Biergelide which is covered with

wood to be in a line with the northern edge of Jensgaard Wood, and then steer westerly on this mark, which will lead close to the northward of the shoal. If coming from the westward, it is necessary, after having passed the shoal, to steer more southerly, as the above mark will not clear the Svane Ground to the southward.

Endelave, and surrounding Shoals, and

To the westward of the Svane Ground, as well as along the east side of Endelave Spit, a narrow channel of 24 feet water has formed itself, but close to the northward of the Spit it is obstructed by a 16-feet bar, on which the bottom is clean but irregular. The mark for running along the S.W. side of the Svane Ground is, to keep Dyngby mill shut in a little by the east end of the easternmost wood on Gerstorflund, near Hov.

The east and south sides of Endelave are quite clean, and may be approached close to the shallows, which are nowhere above a mile off the shore, in many places still less, and a depth of 2 fathoms is to be found close to the beach. To the N., N.W., and W., on the contrary, the island is surrounded by different shoals, the names and qualities of which are clearly indicated in the chart: they run in a N.W. direction, and unite with the shallows off the shore of Jutland.*

Anchorage.

The best anchorage at Endelave is on the north side, abreast of the village, with the following marks—a white-washed rock on the beach, in one with the westernmost house of the village, and the high hill of Dyret on Samsö in one with the northern edge of the little wood on the north end of the island—there, half a mile off the village, there are 2 fathoms water, and good holding-ground; with the white-washed rock in one with a dyke of sea-weed there will be 11 feet water.

Endelave Ground.

This roadstead is sheltered by Endelave Ground, of which a great part is nearly dry, with a low waterstand; but N. and N.E. winds will occasion some sea. The different inlets to the roadstead are to the northward of the Knösen, between the Knösen and Endelave Ground, and between the latter and the spit projecting N. from Kloben, called Möllehage, on which there is little more than a foot water.

Knösen.

178. To pass to the northward of the Knösen keep the northern edge of Biergelide over the north-west cleft, or low part of Jensgaard wood, on which mark the depth will be 2 to 3 fathoms,

* See Chart of the Entrance to the Belts.

and by keeping Biergelide over the northern edge of the same wood you will have 3 to 4 fathoms, which, however, is of no consequence, the anchorage off Endelave village being only fit for small craft. To clear the Knösen to the westward, keep a round wood to the northward of Gylling Ness in one with the eastern face of that point. Small craft, drawing only 7 or 8 feet, may pass between the Knösen and Endelave Ground, by keeping Endelave Wood visible to the northward of the village.

In the bay to the northward of the Mölleground there is said to be a large rock near the shore, but the mark for it has not yet been determined.

179. A mile S.S.W. of Gylling Ness lies a dangerous shoal called the Skomager Ground. It has only 9 feet water, and vessels too deep in the water to cross it from the northward and bound up Horsens Fiord are obliged to pass between it and the Knösen on the mark mentioned above. The mark to clear it to the southward is, to bring the mill on Hiarnö behind the wood on that island before you attempt to steer to the westward. Coming from the southward, as this mark cannot be seen, it will be necessary to sound, and not to approach the shoal nearer than into 15 feet. *Skomager Ground.*

180. Between the points of Gylling Ness and Hundshage is the entrance to the deep and wide Fiord of Horsens, in the mouth of which stand the islands Hiarnö and Alrö, and so surrounded by shoals and shallow water, that the navigation is limited to the narrow channel of Hiarnö Sound. This sound lies between the islands and Hundshage, and leads into an excellent harbour, even for the largest ships, as far as Vaarsö, and for vessels of moderate draught up the fiord to the westward of the town of Horsens. *Horsens Fiord.*

To enter the fiord of Horsens all vessels must pass to the southward of Hiarnö Flat, and then the northern edge of Jensgaard wood is to be kept over a cliff near the beach, a little to the southward of a hut named Præsthuus, until the church and the mill on Hiarnö are in one, when the course may be directed for the Sound.

For large vessels it is necessary to pass to the southward of the Sönder Ground, on which insulated shoal there are only 17 feet water; to effect this, the southern edge of Jensgaard wood is to be brought to bear W.N.W., until the mill on Hiarnö is halfway between the church and Hundshage. That is the leading mark *Sönder Ground.*

into the Sound, as far as the Narrows, for which the mark is to keep a white-washed rock on the beach of Hiarnö a little to the eastward of the church, and by keeping on this mark you pass clear of the spit of Alrö, which is perfectly steep-to.

Current. 181. In Hiarnö Sound, and even more in the Narrows, the current runs strongly, and in settled weather a regular tide exists. Time of high water at full and change is there, as generally along the coast in the vicinity, 12 o'clock.

Alrö Sound. 182. Vessels not drawing more than 7 feet, may enter Horsens Fiord by passing through between Alrö Island and Hiarnö. Coming from the eastward, on the south side of the Skomager, keep a westerly course, until Falling church is a little to the westward of the farm on Gylling Ness, then steer towards the east point of Alrö, and continue this until Horsens church is behind the trees on the west end of Alrö, which then becomes the leading mark until abreast of the N.E. point of Hiarnö, and then it will be necessary to approach the Hiarnö side in order to pass clear of the Alrö Hage.

Alrö is on its N.E. side connected with the shore by a shallow, which, with an ordinary waterstand, may be crossed as a ford. But to the westward of Strevels Head there is an inlet with 10 feet water, though from Alrö mill it is extremely narrow.

Pilots. 183. At Horsens and also at Hiarnö pilots may be had for this fiord, as well as for Thunö, Odense, and Fredericia, and are paid according to certain regulations. Vessels not using a pilot are bound to pay, whether in or outward bound, 2 rbsk. per commerce last for the 16 beacons placed along the channel up to Horsens Harbour, which is formed at the mouth of a rivulet, and dredged out so as to admit vessels drawing 10 feet. In this harbour it is allowed to cook on board, and likewise to light candles. The mark leading through the channel into the harbour is the two beacons in one.

Horsens Harbour.

As Bay. 184. To the southward of Horsens Fiord, between Hundshage and As Head, the shore forms a deep bay, in which the water gradually shoalens towards the beach. The bay is perfectly clean, but off As Head there is a flat, the steep edge of which is passed in 3 fathoms by keeping Hiarnö church right between Hundsland and Gangsted churches, both of which are elevated and conspicuous, and at some distance inland. On the mark of Hundsland and Hiarnö churches in one, there is to the southward

of As Head a detached rocky shoal with 2¼ feet water; and between it and Endelave there are two shoals north and south of each other, viz.: the Middel Flat and Lille Ground, both having 17 feet water on some spots, but generally a depth of more than 3 fathoms; so that these shoals are not dangerous to small vessels. Hiarnö and Gangsted churches in one, lead exactly over that part of the Lille Ground where the depth is 17 feet; but by keeping Hiarnö church well open to the eastward of Gangsted church, you will pass between the above shoals and As Head Flat, this being the fairest track towards the Fiord of Horsens.

185. The projecting northern point of Veile Fiord* is named Biörnsknude, which together with Æbelö may be considered as forming the northern boundaries of the Lille Belt. Off Biörns- *Biörnsknude.*
knude there is a narrow ledge of rock, with only 1 or 2 feet water; it extends 3 cables' lengths off the point, and is surrounded by an extensive flat, especially in a N.W. direction, which by small craft may be approached to the depth of 2 fathoms. The flat extends some distance into Sandbierg Bay, between Biörns- *Sandbierg Bay.*
knude and As Head, as far as the wood near Juidsminde Ferry, and has along its edge only 6 or 7 feet water, but close outside 6 fathoms.

The inner part of the bay has deep water close along the beach, from the ferry to the tile-kiln near Palsgaard; but off that place there are some small shoals, with 1½ to 2 fathoms water, which ought not to be approached nearer than 4 to 5 fathoms. The best anchorage in the bay is abreast of the ferry, in 4½ fathoms, with Biörnsknude just seen over the land inside of the point. As a stopping-place this bay is excellent, not only with westerly, but also with northerly and southerly winds. From Juidsminde a ferry crosses over to the town Bogense in Fionia, or Fyen.

186. The north peninsula of Samsö† is called Nordby Land, to *Samsö.*
the eastward of which there are shallows gradually deepening from the beach, and may therefore be approached by sounding; whereas from the north point, Isse Head, a reef stretches off nearly *Isse Head and Reef.*
a mile, and shows itself above water in two places. There was formerly a channel, with a depth of 5 or 6 feet, inside of this reef and close to Isse, but it is now impassable, even by boats. To

* See Entrance to the Baltic, Sheet III. † Sheet I.

clear the reef to the eastward, keep Besser church well open to the eastward of the village of Stauns; and to the westward Kolsör Hage must be kept in sight outside of Földals Cliff.

187. To the eastward of Isse Head lies a sandy flat, on which there are several small rocks, with 11 or 12 feet water; they are called the Klepperne, and their shallowest part is when the northernmost mill of Nordby is in one with the north end of Annebierg, and Thunö church just visible outside of Isse Head; or, in general, when Thunö church is in one with the head; whereas the depth on both sides of this mark pretty quickly increases from 4 to 7 fathoms.

Klepperne Shoals.

Beacon. A floating beacon, having a white pole with one broom, is placed on the north end of the Klepperne, in 2 fathoms, about N.E. ½ N., 1½ miles off Isse Head.

To the westward also of Isse Head there is a small sandy flat, on which the depth increases gradually by proceeding westward.

The west side of Nordby Land is clear as far as Asmör Hage, off which point a reef extends a cable's length. By passing this reef and anchoring in 5 or 6 fathoms, vessels may find good shelter against northerly and easterly gales.

Samsö Bay. 188. The whole of the bay of Samsö, between Asmör Hage and Ringebierg Sand, has a clean sandy bottom and good holding-ground. Westerly winds occasion a heavy sea, and vessels must therefore get underway in time, when the wind veers round to the westward.

The southern part of this bay is called the Sælvig, and outside lies the Ringebierg Sand, towards which extensive flat the water shoalens gradually; so that by sounding it may be avoided or passed over in a convenient depth, the light-coloured sand making the edge of the shoal conspicuous. This flat extends 1½ miles off the shore, and is divided by a deep-water recess of 6 fathoms; the northern half of the flat carrying 3 fathoms nearly all over, and the southern somewhat less water. The eastern shore of Helgenæs kept open to the westward of Samsö clears this flat, in deep water; but small vessels, which can cross the flat in 2 or 3 fathoms, may run Helgenæs somewhat behind Samsö. With the wind off the shore this sand affords good anchorage: the best is on its northern confines, in 3 or 4 fathoms, Dyret bearing S.S.E., or Ellemandsbierg a little outside of Samsö.

Ringebierg Sand.

The bottom in the channel outside Ringebierg Flat is fine

sand and mud; whereas, on approaching the Svane Ground, which consists of coarse sand, gravel, and shingle, the bottom is coarse sand. By this circumstance it is possible, during dark or in foggy weather, to judge on which side of the deep-water channel, with 18 fathoms water, the vessel may be. From Ringebierg Sand to Vestborg Point the shore is perfectly clean, and has deep water not far from the beach. The indifferent harbour named Koldby Kaase only admits boats drawing 4 feet. *Vestborg Point.* *Koldby Kaase.*

189. On the south side of Samsö, between Vestborg Point and Luus Point, shallow water extends a little further out, especially near both points, thus forming a bay, which is a stopping-place with northerly winds.

The shallow along the eastern shore of Samsö, from Luus Point to Udsagers Hage, is narrow and gradually shoals towards the beach. Off Baller Hage there is a small flat, which may be approached by the lead; and close to the northward of it is Brundby Ferry, the harbour of which has 4 feet water, and from which a ferry-boat plies across the Belt to Kallundborg.

At Udsagers Hage the shallow bank begins to widen, and, in conjunction with the Kyholm and Lindholm Banks, forms Kyholm Sound and Harbour.

190. Kyholm is an island lying off the N.E. shoulder of Samsö, on which there is a quarantine establishment, with the necessary arrangements for unloading and purifying vessels liable to that process. The channel between them is named Kyholm Sound, and forms an excellent summer harbour;* but those vessels that are obliged to perform their quarantine in winter may find perfect security in the harbour Langöre, which lies farther in, behind a neck of land on Samsö. *Kyholm.* *Quarantine.* *Kyholm Sound.* *Langöre Harbour.*

191. To enable navigators to approach as near as possible to Kyholm without risk during the night, the revolving light has been altered to a Fixed light, 57 feet above the level of the sea, and visible from 8 to 10 miles. Pilots are likewise in readiness on the island; but as it might happen that a vessel may be obliged to run for the harbour without being able to procure a pilot, we shall give a description of the channels into the harbour and their proper marks. *Kyholm Light.* *Pilots.*

192. The objects affording such marks, and their relative position to each other, with all which it is incumbent on the commander *Objects used as marks at Kyholm.*

* See Plan.

to be familiar beforehand, are: the hill of Ellemandsbierg in Jutland; the Islands of Hielm, Værö, Lindholm, and Kyholm; Bylykke and Oggeldal, two remarkable clefts on the Nordby shore, with the hillock of Bikuben, Nordby church, and Morup village; the fort of Lilleöre, and the houses on Langöre; Stauns village on the isthmus; Taflebierg mill, Onsbierg and Besser churches, and Besser mills, on the southern part of Samsö; likewise the batteries on the Havne Hage shore of Samsö; three remarkable hillocks on the east side of Hiortholm; the high and broad hill on the middle of Hiortholm, named Hiortholm Mound; the high land on Hiortholm Head; the remarkable hillock Hönsepol; and, finally, three beacons erected on Meilesholm, Arme Head, and Havne Hage. For the greater security, the most dangerous places are marked by poles fastened in the ground, and they are of great use to navigation.

Entrances to Kyholm Sound.

193. Into Kyholm Sound there are four openings, two only of which will admit large vessels. The principal entrance from the northward is called Kyholm Channel, which lies between the island and the Kyholm Boe Reef, and has a sufficient depth of water for vessels of any size, viz. 5 to 7 fathoms, but it is only two-thirds of a cable's length across. The other channel from the northward, with a common waterstand, has only 12 feet water, and lies between the shoal of Kaagesöre and Kyholm Boe Reef. The principal entrance from the southward is Lindholm Channel, between Sandene Flat and the flats off Lindholm, and has in general, in its shallowest part, 14 to 15 feet water. The other channel from the southward, crosses the Sandene Flat between the Klummer and the Reef off Hönsepol hillock, but it has now only water enough for vessels drawing 6 feet, though 50 years ago the depth was 9 feet.

Kyholm Channel.

194. To enter Kyholm Channel steer direct for the N.W. point of Kyholm, keeping Besser church close to the westward of it, and in such a manner as to bring that church in one with the beacon on Meilesholm before Lindholm shuts behind Kyholm;* and continue in this mark until the Bylykke Skaar

* A recent edition of the "Danske Lods" says that this channel is so much filled up that the above mark will lead a vessel over the edge of the flat, in 13 feet water; so that she must be kept a little farther to the eastward. It adds, that there is a rocky patch, with 7 feet only, close to the westward of the mark.

and Oggeldal, on the Nordby shore, are in one; then steer on that mark until the middle of Nordby church is in one with the northern part of Morup village, and this latter mark will then lead to the best anchorage, with Taftebierg mill in one with Hiortholm, and with Værö Island open to the southward of Kyholm, where the anchor may be dropped in 5 to 7 fathoms. But the anchorage is good the whole distance from abreast of the S.W. point of Kyholm near to the west point of Lindholm.

The narrowness of the channel does not allow large vessels to beat through it; but that side of Kyholm may be approached within half a cable's length except at the N.W. and S.W. points, off which there are short reefs; the former may be taken close, by keeping Onsbierg church in one with the highest part of Lilleöre battery. Kyholm Boe Reef is surrounded by a sand flat, off the north-east end of which there is a buoy that may be approached by keeping the lead going, and vessels drawing 12 feet may pass it, with Besser church in one with the eastern edge of the easternmost hill on Hiortholm.

The turning marks for the Sound are: for the north side, Nordby church just open to the northward of the village Morup, and for the south side the whole of Nordby church fully shut in on the north end of Morup. It is of course necessary to keep the lead quickly going, and to tack immediately when the depth is 3½ fathoms, the banks in the sound being steep-to on both sides, but plainly indicated by the colour of the water. *Kyholm Sound*

195. The mark is for the channel between the shoals Kyholm Boe and Kaagesöre Shoal (on the N.E. prong of which there is a black pole and broom, standing in 14 feet water); bring Besser church midway between Hiortholm mound and the westernmost of the three hills on the eastern side of Hiortholm, before Lindholm and Kyholm touch, and this mark is to be continued until the tail of the latter comes in one with the south-east point of Kyholm; then the middle of Nordby church is to be brought in one with the north end of the village Morup, which, as above mentioned, is the leading mark for the Sound, and must be nicely kept. Another is, to steer in as above until Bylykke and Oggeldal are in one; and proceed on that line until the same leading mark for the Sound comes on.* *Kaagesöre Channel.*

* A recent edition of the "Danske Lods" says, that in the channel to

Lindholm Channel. 196. The Lindholm Channel is entered from the southward by keeping Ellemandsbierg in one with the eastern point of the high ground on Lindholm, on which mark it is necessary to be before all the houses of Langöre become visible to the northward of Hönsepol; continue on this course, until the two western extremities of Lindholm and Kyholm are in one, which then becomes the leading mark till the beacons on Havne Hage and Arme Head are in one. Follow the line of these beacons till Besser church is midway between Hönsepol and the southernmost battery on Havne Hage mound, or till Hiortholm is in one with that battery, when the anchor may be dropped in 5 or 6 fathoms; or you may proceed farther up the Sound by keeping nearly the whole of Nordby church over the north end of the village Morup. If this mark is not to be seen, the course to be steered is N.W. ½ W.

Sandene Flat. 197. To pass over the Sandene Flat, bring the north point of Havne Hage and the S.W. point of Kyholm just barely open before all the houses at Langöre are visible to the north of Hönsepol, and continue in this mark until Besser church is to the westward of Hönsepol; then steer in such a manner that Isse Head is in one with the S.W. point of Kyholm, which is the leading mark for the Sound.

198. There are some dangerous shoals outside of Kyholm Island, viz.:—

Langballe Ground. 1. Langballe Ground lies N.E. of the N.W. point of Kyholm. On its shoalest part there are 14 feet when Hiortholm mound is in one with the west side of Kyholm; the hill of Bikuben (bee-hive) a little in on the north side of Morup; the easternmost of Besser mills its own height east of Kyholm; and Hönsepol midway between Kyholm and Lindholm. The shoal is cleared to the northward when Bikuben hill* is close to the

---

the northward, between Kyholm Boe and Kaagesöre, there is a shoal called Morten Henricks Boe, extending about 130 yards N.N.W. and S.S.E., which consists of rocky patches with 7 feet water, the mark for which is, Bylykke in one with Oggeldal, and Besser church midway between Hiortholm mound and the westernmost beacon hill. Close to its S.E. side there is a beacon with a striped staff and two brooms, in 14 feet, with Besser church in one with the ridge on Arme Head, about a third of the ridge to the westward, and Bylykke nearly in one with Oggeldal.

* Bikuben hill being almost invisible, the following mark is given to pass to the northward of the shoal; the southern extremity of Nordby land open to the southward of Morup village.

northward of the north end of Morup; to the eastward when Besser church is in one with the east end of Kyholm; and to the westward when Besser church is in one with the west end of Kyholm.

2. Kyholm Boe, on the north end of which there is a buoy, lies N.W. by N. about 6 cables' lengths off Kyholm, and is cleared to the northward as long as Lindholm and Kyholm do not close; to the southward by keeping the south point of Kyholm in one with its S.W. point, or Bylykke and Oggeldal in one, which is the leading mark for the Sound. Besser church in one with the easternmost hillock on Hiortholm leads to the eastward of the shoal in 2 fathoms; and Besser church midway between the westernmost of those three hillocks and the mound on Hiortholm. *Kyholm Boe.*

3. Kaagesöre Bank extends about 7 cables' lengths N. E. by E. ½ E. from Kaagesöre Point, and on its north-east end there is a beacon, with a black pole and one broom, in 14 feet, with Besser church just open to the eastward of the new Custom-house on Langöre. To clear it to the northward, keep the south point of Kyholm in one with the highest part of Lindholm; or the small island of Værö just open to the northward of Kyholm; and while Besser church is open to the east of Hiortholm mound it will be cleared to the eastward. *Kaagesöre Bank.*

199. Off Lindholm the detached rocks are—

1. Klummer Reef, which lies 7 cables' lengths E. by S. from Hönsepol, and is passed to the southward when the houses on Langöre are just visible to the northward of Hönsepol; to the eastward by keeping the low elbow of Albuen inside the high land of Udsagers Hage: or in the depth of 15 feet, by keeping Isse Head between the two north-westernmost storehouses on Kyholm; and to the westward when the north point of Havne Hage is in one with the S.W. point of Kyholm: but vessels that draw only 5 feet can take this passage. On the shoalest part of the Klummer the depth is 6 feet. *Shoals off Lindholm.*

2. Diævle Boe, on the west side of which shoal there is a buoy, lies 1½ miles to the eastward of Hönsepol, and the marks for it are: Kyholm and Lindholm end to end; and Hönsepol midway between Hiortholm Head hills and the village Stauns. It is passed to the southward by keeping Stauns village open south of Hönsepol; to the eastward when the small island of Hielm is

midway between Værö and the easternmost extremity of Lindholm, named Rumpen; and to the westward when Kyholm and Lindholm are kept just open.

3. Stubs Boe lies a third of a mile north of Diævle Boe, and the marks for it are; Nordby church in one with the west side of Lindholm, and Hönsepol midway between Hiortholm Head hills and Hiortholm Mound. To clear it to the southward, keep those hills close to the northward of Hönsepol; and to the westward, keep Kyholm and Lindholm a little open.

Kyholm Harbour.

200. Kyholm Harbour is excellent in summer, for although it is narrow it will admit the largest ships through Kyholm Sound, and vessels not drawing more than 14 feet may work in and out with nearly all winds; the holding-ground is good, the bottom being partly clay, and the depth between 5 and 7 fathoms.

Tides.

201. With moderate weather the current sets regularly 6 hours each way, but in boisterous weather it does not vary, and sometimes attains a velocity of 3 knots, although the water does not rise or fall more than a foot or two above or below the common waterstand. Kyholm affords excellent fresh water, and at the south-west point there is a harbour for boats, with a depth of 4 to 5 feet.

Water.

Langöre Harbour.

202. In winter vessels are occasionally annoyed by drifting ice, in which case, if they do not draw more than 13 feet, they ought to repair to the harbour at Langöre.

Between the numerous small islands and holms or cays, on the north-east side of Samsö, is a pretty deep channel, admitting vessels drawing 10 feet as far as Karlskol. The outer part of this channel, from Havne Hage to Langöre, is a good harbour in summer for vessels drawing from 12 to 14 feet, sheltered against all winds, and having good holding-ground of sand and mud. Langöre is a safe harbour during the winter, for although the holding-ground is somewhat loose, it is easy, owing to the narrowness of the channel, to carry the anchors ashore, and thus to moor. The ice generally breaks up here earlier than in the neighbourhood. At Langöre there is a quay, alongside of which vessels drawing 10 feet may come; there is likewise a corn magazine, two other store-houses, a custom-house, and pilots. Water, but indifferent, is to be had, and provisions at a tolerable price may be procured without difficulty.

Inlets to Langöre.

203. Three channels give access to this harbour, between

Kyholm Boe and Kaagesöre, the Kyholm Channel, and Kyholm Sound; that is, from the north-west, north, and eastward.

Marks for Kaagesöre Channel.

Entering by the north-western channel, it is to be observed that before Kyholm and Lindholm close, Besser church is to be brought midway between Hiortholm Mound and the westernmost of the three hillocks on the east end of that island, and this mark is to be continued until the eastermost low point of Lindholm (Rumpen) is just in one with the south-east point of Kyholm; then, Besser church is to be brought in one with the westernmost of those three hillocks, and steered for, until Kaagesöre Hage is just about to come in one with the south-west point of the Nordby shore. Follow this mark until Besser church is midway between the middlemost and the easternmost of the three hills on the E. end of Hiortholm, which is then to be adopted until Onsbierg church and Taftebierg mill come open of Hiortholm Head hills: and finally continue on this mark until Nordby church is in one with the road south of Arme Head, and then the anchor may be dropped in 3 fathoms.

Marks for Kyholm Channel.

204. If entering by the Kyholm Channel, east of Kyholm Boe, the beacon on Meilesholm is to be kept in one with Besser church until arriving in the mark for the sound (Bylykke and Oggeldal in one), or until the south-east point of Kyholm is open of its south-west point. Adhere to this Sound mark until Besser church is midway between the westernmost of the three hillocks on Hiortholm, and then follow the marks above mentioned.*

Marks for Kyholm Sound.

If entering from Kyholm Sound, keep Nordby church in one with the north end of the village of Morup until arriving in the mark for the sound as above.

Sörenholm Reef.

205. Besides the shoals already described at the entrance to Langöre Harbour, the Sörenholm Reef lies a third of a mile N.E. by E. from Lilleöre Point, with a beacon on it; but the shoal may be passed to the northward by keeping Kaagesöre Hage just open of the south-west point of the Nordby shore, and to the eastward by bringing Besser church in one with the eastern side of the middle hillock on Hiortholm.

206. We have yet to mention the islands, rocks, and shoals at the northern entrance of the Great Belt, and in the vicinity of Samsö. They form two lines or ranges extending nearly north

* See Note to Art. 195.

and south with the present variation of the compass. The inner
Hatter Reef Beacon. or westernmost range consists of 1, Værö Island; 2, Bosserne, an extensive reef or rather a cay; 3, Hatter Reef, dry in some places, and having at the east end a floating beacon with a pole carrying two brooms, which lies in 4 fathoms; and 4thly, Hatter Barn, a flat, on which the least depth is 17 feet. The outer range, on the contrary, is a succession of shoals extending from the island of Hielm: 1, Mosel Ground, with 13 feet; 2, Marthe Flat, with 20 feet; 3, Great and Little Münke Grounds, with 14 feet; and 4, the Middel Flat, with 18 feet.

Mosel Ground. 207. The shoalest spot on the Mosel Ground has 13 feet on a heap of loose rocks about 30 yards in diameter, and close to it in all directions a depth of 3 fathoms. Carlsbierg, kept in one with the low south-west point of Hielm, leads close to the eastward of the reef in 4 fathoms water, and Dyrehöien, in one with the south point of Hasenöre, clears it in the same depth to the northward. This mark leads also between the Mosel Ground and the flat of Hielm.

Marthe Flat. 208. Kolhöi windmill in one with the east side of Værö, or the beacon of Arme Head in one with Kyholm lighthouse, carry 4½ fathoms close to the western side of Marthe Flat; and Besser church open to the eastward of Værö leads about a cable's length to the eastward of it in 5 fathoms water.

Munke Grounds. 209. The most southern knoll on the Munke Grounds lies in the direction of Kyholm lighthouse, just open to the southward of Bosserne, with respectively 18, 16, and 18 feet water; this is called the Little Munke Ground. The Great Munke Ground, with 18 feet water, is about $1\frac{1}{3}$ miles to the north-eastward of the former; and the churches of Tranebierg and Besser in one, lead close to the westward of it. When Tranebierg church appears to open one degree to the southward of Besser church, and Kyholm light appears in one with the south side of Værö, you are to the eastward of the Little Munke Ground in 7 fathoms. These marks may serve to guide vessels that choose to go that way; but the commonest and easiest passages are made through Værö Sound, between that island and Bosserne, or by the Lindholm Channel between Værö and Lindholm. The latter is the least frequented, as it requires so great a change in the course; besides which the shallow tail that joins Værö to Værö Flat offers a convenient anchorage for small craft, with

southerly winds. A floating beacon, with a white pole and two brooms, is placed at the north-western spit of Værö, in 6 fathoms water; and on the north-east angle of Lindholm Flat there is another floating beacon, with a red pole and one broom, in 3 fathoms water. *Lindholm Channel.*

210. Værö Sound may be navigated by consulting the chart, but due attention must be paid to avoid the Flensborg Ground, consisting of rocks, and having on its shoalest part only 8½ feet water. This spot is 2 miles from Værö, and off its eastern extremity; in 4 fathoms, there is a floating beacon with a red pole bearing one broom. The mark to clear the eastern edge of this shoal, and to lead into Værö Sound from the northward, is Kolhöi windmill (on Samsö), just open to the eastward of Værö. Small vessels that intend to cross the Flat may run inside of this shoal when the eastern edge of Ankile wood (in Jutland) is nearly open of the west side of Hielm; or when Besser church (on Samsö) is open west of the western cliff or high land of Værö. From the southward it is not to be approached so near as to bring Dyret Hill (on Samsö) in one with the middle of the Hönsepol. *Værö Sound.* *Flensborg Ground.*

211. But the principal entrance to the Great Belt from the northward is the channel named Seierö Deep, to the eastward of all these shoals, and with plenty of room for vessels of all sizes to beat through. The depth however is remarkably irregular, so as to afford no assistance to the navigator. In making this passage due attention should be paid to the Outer Flat, which lies on the parallel of the Rönnen and the Mosel Ground, nearly midway between these shoals, and also to the two Munke Grounds, which lie nearly in the middle of the passage between the Siælland Reef and the Flensborg Ground (Art. 209). From this flat a 5 fathoms ridge, with a coarse bottom of gravel and stones, projects N.E. by N., and then the depth increases to 10 fathoms on all sides, the bottom consisting, within this limit, of sand and gravel. But about its north end it is mixed with pebbles, and at the north-east corner of the bank, in the depth of 7 or 8 fathoms, there is in one spot found a most extraordinary bed of red corals. The Munke Grounds divide the north entrance of the Belt into two distinct channels, the westernmost having 11 to 15 fathoms water with the greatest depth close to the western shoals; and the eastern channel with 13 to 20 fathoms; the deepest water *North entrance to the Great Belt.* *Munke Ground.*

being over against the north end of Siælland Reef, but decreasing to 13 and 11 fathoms when to the southward of that reef, where the bottom is soft with sand and brown shells, and near the reef in 6 to 8 fathoms pure sand.

Seierö Point.

212. Large vessels ought not to come nearer the N.W. point of Seierö, on which a lighthouse has been recently erected and a Revolving light exhibited (*see* Art. 226), when so far to the southward that the church is in one with the lighthouse, than to keep Veirhöi (a lofty hill on Siælland) in view open to the northward of the island. As a general mark for passing to the eastward of all the shoals, vessels should not stand farther to the westward than to keep Hielm to the west of north, before Veirhöi is open to the southward of the north-west end of the island of Seierö, called Seierö or Gniben Point, nor to bring Reef Ness, a remarkable promontory on the west side, to bear more southerly than S.S.W. ½ W. before Besser and Onsbierg churches are in one. This last mark leads to the southward of all these shoals, and on this leading-mark Samsö may be approached pretty near. The navigation here has been greatly facilitated by the erection of a Fixed light on Reef Ness; it has lenses of the 4th order, elevated 65 feet above the sea, the lighthouse itself being 30 feet high, so that the light may be seen 13 miles off from the deck of a vessel of moderate size.

Reef Ness Stationary Light.

CHAPTER III.

THE NORTHERN SHORE OF THE ISLAND OF FYEN AND SIÆLLAND FROM ÆBELÖ TO GILBIERG HEAD.

213. Between Endelave and Æbelö the navigation is all clear, the depth 9 to 12 fathoms, and bottom clay. In the bay to the eastward of Æbelö there is good anchorage in 2, 3, and 4 fathoms, and good holding-ground.* In entering this bay from the eastward care must be taken to avoid the Middel Ground, extending a considerable distance off the point Agerness, and dry in several places; it is cleared to the northward by keeping Rosenvold Point visible outside of Æbelö. To enter the bay Klinte church is to be kept in one with the westernmost farm near the village of Nörreby. *Anchorage to the East of Æbelö.*

If entering from the westward, the flat projecting N.W. from Æbelö may be crossed in 2 to 3 fathoms, according to the draught of the vessel, and you may enter the bay on the east side of Æbelö, when the wood at Einsidelsborg becomes visible open of the island. The best anchorage for small vessels is abreast of the tile kiln, so near the beach that the west point of Endelave just shuts with the east point of Æbelö, where the depth is 10 to 11 feet, and the bottom clean sand with clay underneath. In standing farther to the eastward the depth will be from 3 to 4 fathoms towards the Middel Ground, where the water quickly shoals to 2 fathoms, which is the depth close to the edge of the shoal.

214. Inside of the Middel Ground, Nörreby Rende is a narrow inlet with 6 to 7 feet water, and soft bottom, where a small vessel may run in till a solitary tree on the south side of Æbelö is seen midway in the gap of the wood on the island; and if she has lost her anchors, she may run ashore but on the north side, *Nörreby Rende.*

* *See* Entrance to the Baltic. Sheet III.

towards the Middel Ground, where the bottom is entirely free from rocks. The low shore from Agerness to the estuary o Odense Fiord is quite clear of danger, and may be approached by the lead, though about half-way the 4 fathoms line projects 1½ miles from the beach.

Odense Fiord. 215. The opening to Odense Fiord lies between the very low neck of land called the Hals, to the westward, and to the eastward the high rocky and barren peninsula of Skoven, on which there is a look-out kept for the signal for a pilot. If the pilot does not

Pilots. come out and the wind is fair, you may run in without the least difficulty, by keeping about a third of the breadth of the channel off the Hals shore, where the least depth will be 17 feet. When rounding-to, keep the same distance from that shore, which is steep-to, on the south side, and anchor S.S.W. of the point to wait for the pilot, as in this berth you will be out of the strength of the current. With a fair wind and clear weather a vessel may even proceed farther in without a pilot, by keeping the lofty spire on St. Knud cathedral, in the town of Odense, in one with the middle of Roholm, a remarkable, small, low green island, having somewhat the appearance of a battery.

On this mark she will not have less than 17 feet water until Ostergaard mill, or the eastern side of Lindö, is in one with Flintholm, and there she should anchor and wait for the pilot, as from thence the channel is so narrow and intricate that a perfect acquaintance with the locality is requisite for its navigation.

Klintebierg. Vessels drawing 15 feet may proceed as far up as Klintebierg, and winter there if required. The channel from this place to Odense only admits vessels drawing 8 feet.

Besides the pilot at the mouth of the fiord, another lives at Giersö, and a third one at Stige, but this last one is principally employed by outward-bound vessels.

Tide. In this fiord a regular tide exists, which, although influenced by the winds, is however more regular than on any other part of the coast hereabouts, as well with respect to its time of change, as to its rising and falling; the usual difference between the highest and lowest water being about 2 feet.

Custom House. The Custom-house officer lives at Boelsöre Point, and consequently every vessel, whether inward or outward bound, is obliged to come to an anchor off Flintholm, and is subject to visitation.

216. The bay outside of Odense Fiord, between Skoven and the opposite shore of Hindsholm, is clean, with from 6 to 10 fathoms, and both sides may be approached by soundings.

Hindsholm.

217. On the north-west end of Hindsholm, inside of Fyen Head, lies Korshavn, a safe and spacious harbour for vessels drawing 14 feet. It is sheltered by three shoals, the southernmost of which projects from the north point of Langö, and on it there is a rock that dries with a common waterstand, but surrounded by a flat with 10 or 11 feet. On this flat there is a shoal with, 8 feet and close to its east side are 2¼ fathoms. From this shoal, on which there is a buoy, the north point of Langö bears S.E. by E., Korshavn Point (on the north side of the entrance) E.N.E. ½ E., and the N.W. extremity of Fyen Head N. by E. The middle shoal is the largest, and the northernmost shoal, having only 3 or 4 feet water, lies near the shore, immediately to the southward of a remarkably large rock on the beach. The mark to pass to the westward of all these shoals is to keep the whole of the wood on Samsö visible outside Fyen Head.

Korshavn Harbour.

South entrance.

Between the above shoals there are two entrances, of which the southernmost entrance is the deepest and easiest of access, especially to those unacquainted with the place.

Beacons.

As a guide for entering the harbour, there are erected two wooden beacons, 18 feet high, each of which carries a barrel. The westernmost stands on a low point, forming the western side of the harbour, and the other on the higher ground, about E. by N. from the former, and is visible 7 miles. The entrance is pointed out by 3 broom beacons, placed as follows,—one to the southward of the middle shoal, another to the northward of the southernmost shoal, and a third on the shoal, whereon there are 8 to 9 feet water. In making the harbour, pass outside the shoals, and keep on the above-mentioned mark, until the easternmost beacon comes just visible to the northward of the low beacon on the point, and keep on this mark until abreast of the first broom, or until the whole of the northern part of Meilö is well open of the north end of Langö, then bring the beacons in one, minding to pass close to the low point on the port hand, and when about a cable's length within it, there is excellent anchorage in 3 fathoms good holding-ground. Small craft drawing less than 12 feet may, by attention to the lead, pass to the east-

ward of the broom which stands on the 8-feet shoal; being careful to avoid the land-shoal until both beacons are well open of the north end of Langö, and then pass between the above-mentioned broom and the southernmost shoal, which is nearly dry, and therefore discernible, until the beacons are in one, and enter the harbour as before directed.

North Entrance. Vessels of not more than 11 feet draught may pass between the two northernmost shoals, and then keep Scheelenborg or Hersnap mill in one with the eastern side of Bogö, until Stubberup church is in one with the south side of Meilö; then to avoid the middle shoal, haul to the eastward towards the low point, but be careful to attend to the lead, in order to avoid a sand-flat extending from the said point in a westerly direction. When the beacons are in one, steer into the harbour as above mentioned.

With S.W. gales some sea may be raised here, but not of much consequence, as it is kept down by the shoals outside. Small craft and boats may run behind the low point, and be perfectly landlocked. It is intended to have mooring posts fixed in this harbour.

Korshavn might even be a winter harbour for vessels bound for Odense Fiord, in case of the Fiord being frozen up and thus inaccessible.

Fyen Head. 218. From the extremity of Fyen Head, on which there is a high hill, named Baesbanken, as well as from the low neck of land to the eastward of it, several small reefs project, and are surrounded by a pretty extensive flat, on which the depth is generally 2 fathoms; but farther out there are many rocky patches with only 6 or 7 feet water.

Floating Beacon. Near a rock, with 6 feet water to the N.N.E., 1¼ miles from Korshavn Eastern Beacon, there is a floating beacon, with a white pole and two brooms, in 3¼ fathoms water.

Fyen Head Flat. Coming from the westward, Fyen Head may be passed pretty close; but you must not haul to the southward before Romsö is well open to the eastward of the north-eastern low point. Then steer S.S.E. round that low point, at the distance of 4 cables' lengths, and the least depth will be 2 fathoms; but not more easterly, in order to avoid two small rocky patches lying on the flat, till Agerness mill shuts in behind the Head.

Lille Ground. 219. The south end of the Lille Ground is a little more

than 2 miles from the Baesbanken Hill on Fyen Head. It is a ledge of rocks, about 2 cables' lengths long, and not more than 30 yards across, and carries only 4 feet water on the shoalest part. The mark for this spot is Stubberup church in one with the west side of Savesborg, a remarkable cliff on the eastern beach, and the wood at Hoffmannsgave, just open outside Fyen Head. This shoal may be passed round to the northward in 5 fathoms, which depth is in some places 15, in others 680 yards from the reef. On its eastern side there is a floating beacon, *Beacon.* with a pole with one broom, in 4 fathoms, with Kolhöi Mill just open to the eastward of Brattingsborg Wood.

220. There are two other shoals between Samsö and Fyen Head: Paludan Flat and the two Bolsaxens.*

Paludan Flat is due south 2½ miles of Vestborg on Samsö, *Paludan Flat.* with a depth of 3 to 4 fathoms; but as 15 feet only have been found there in one spot, vessels ought not to make too free with it.

221. The Bolsaxen and the False Bolsax are two of the most *Bolsaxen Rocks.* dangerous shoals in the Danish seas; they lie just in the track between the Islands of Fyen, Samsö, and Siælland. The Bolsaxen, the southernmost, is covered by only 5 feet water on its shoalest part, which is a short curved ledge of rocks, extending W. b. N., and E. b. N., the concave side facing northward.† From this place Ulstrup church, on Reef Ness, is seen in one with a remarkable cliff on the shore; Besser church is seen a little inside of Baller Hage, and Koldby church and mill just in one with the western edge of the wood on Samsö. Of course, to pass to the westward of this shoal, the church and mill must be well opened to the westward of the wood; and by opening them eastward of the wood will lead clear to the eastward of the rocks. The Bolsaxen may be approached by sounding as near as 4 fathoms; but then the water quickly shoalens to 2 fathoms on the verge of the rock. The surrounding flat is most elongated towards the S.E; and on the eastern side of it, in 6 fathoms, *Beacon.* there is a floating beacon carrying two brooms.

222. The False Bolsax has been recently discovered, and is of *False Bolsax.* small extent. It lies N.E. b. E. ½ E., about 2½ miles from the former, and W. ½ N., from Reef Ness Light, making a link in the chain of shoals connecting that point with Fyen Head. The

* *See* Entrance to the Baltic, Sheet I. † View 15.

shoalest spot is on the west side, having only 12 feet water over large rocks. A floating beacon is placed there, carrying a red ball on a striped pole, and which vessels ought not to approach within 1½ cables' lengths. From the beacon Koldby church is seen, one-third of the width of Brattingsborg Wood inside of its north end, and Rörby and Aarby churches, in Siælland, in one.

Beacon.

To pass in safety to the northward of it, keep Koldby church in one with the north side of the wood of Brattingsborg.

Reef Ness. 223. Reef Ness is the westernmost headland of Siælland, and forms the northern point of Kallundborg Fiord, and likewise of the Great Belt; it is a point of much consequence to the navigation of these seas, and as such it has been provided with a Fixed light (Art. 212). A reef extends N.W. b. W. ½ W. nearly 4 cables' lengths from the Ness; but at 2 cables' lengths there is a passage for boats across it, with 6 feet water, and two-thirds of a cable's length wide. Inside of this passage for boats the reef is partly visible above water, and outside of it there are only 2 to 3 feet water on the reef. At its outer extremity the depth gradually increases to 22 feet, where there are two rocks, named the Puller, with 7 feet water, and fully a mile off shore. Close outside of them deep water will be found, for which reason they ought not to be approached nearer than in 9 fathoms. A floating beacon, with one broom on a white pole, is placed on the outer end of the reef in 6 fathoms, with Aarby church just clear of the high land of the Ness.

Beacon.

Kallundborg. When bound to Kallundborg, and from the northward, vessels ought not to steer to the eastward into the fiord before Kallundborg church becomes visible to the southward of Reef Ness shore.

224. From the Ness to Mulen, at the entrance to the creek Saltbæk Bay, the shallow along the coast is very narrow; but from Mulen, till past Store Vroy, and abreast of Alleshauge, the flat extends so far out that the 4 fathoms line is 1½ miles off Store Vroy.

Saltbæk Creek. The entrance to Saltbæk Vig, or Bay, is between Mulen and Lille Vroy, but it is very narrow and intricate, and has only 4 to 4½ feet water; whereas in the bay itself there is plenty of water and of room. No doubt this inlet might easily be made deeper, with the more facility, as the strong tide would help to keep open a deep-water channel.

On either side of Store Vroy there are only 1 to 2 feet water; but in the bay, between Alleshauge and Stold Points, the shallow along-shore again is of small extent, and the general depth in the bay is 4 to 6 fathoms. Midway, however, or somewhat nearer to Stold, there is a flat with only 14 to 16 feet on it. In the bay between Reef Ness and Seierö large vessels must pay attention to the four patches of rock marked in the chart.

225. The Island of Nexelö is joined to Siælland by a ford; and between it and Ordrup Ness there is a deep bay, with 4 to 5 fathoms water, so well sheltered by Seierö and by the shallows in the offing as to afford an excellent roadstead, though somewhat exposed towards the N. and N.E.; but the depth outside being only 4 to 5 fathoms, and the bottom being overrun with seaweed of luxuriant growth, the sea in this bay is not much disturbed. *Nexelö.*

To enter the bay, Havnsö mill is to be kept twice its own height to the eastward of Nexelö. The best anchorage is in 4 fathoms, when the southernmost farm on the island just becomes visible to the southward of the high land; and Kongshöi, a hill on Seierö, is in one with the north end of Nexelö. Oddens church is seen from this place a little outside Ordrupness, and the inn at Farverbo Kro is in one with Fölleslöv church. *Nexelö Bay.*

226. Half-way between Ordrup Ness and Seierö there is a flat, with several rocky patches, one of them carrying only 9 feet water. *Ordrup Ness*

Moderate-sized vessels may pass between this shoal and the short reef off Ordrup Ness, but large ships are obliged to pass between it and the reef off the S.E. end of Seierö. To avoid this reef, the end of which is steep-to, Havnsö mill is to be kept well open to the eastward of Nexelö. Farther in, towards Nexelö, there is another shallow with 15 feet, which of course is to be avoided by ships.

On Seierö Point, the N.W. extremity of Seierö Island, a round lighthouse 52 feet high has been recently erected, in which is exhibited a Revolving light 103 feet above high water. It consists of 9 lamps with reflectors, and shows a bright light every two minutes, which continues about 12 to 15 seconds, and visible in all directions at 14 to 16 miles distant. This light will be found very useful to vessels going through the northern entrance to the Great Belt. *Seierö Revolving Light.*

Seierö S.E. Reef.

227. Off both ends of Seierö there are reefs, the south-east-one extends nearly 2¾ miles from the point, and is steep-to, with 9 fathoms close to its extremity. Nor should its eastern side be approached within 7 fathoms, as close to that depth there are only 2 fathoms, whereas the western side of the reef may be approached by the lead. The reef itself consists of small rocks, and has in few places not more than 2 to 3 feet water.

Seierö N. W. Reef.

228. The reef off the N.W. end of the island is not a mile in length, and vessels may borrow on it by the lead, though not within 3 or 4 fathoms, as detached rocks are found farther in, and off the N.N.W. point they rise abruptly from the depth of 3 fathoms to 10 feet; likewise on the north side of the island there are several detached rocky patches, of which one, with only 5 feet water, lies about 3 cables' lengths from the beach, and N. by E. from Seierö church. There is a high and dry rock also N.N.W. from Seierö Point; and W.S.W. from it a patch of rocks with only 1 or 2 feet water, another rock above water S.W. by W. half a mile from Seierö Point and a third of a mile off shore. When off the spit of the N.W. reef, the church on the island will be seen as well as a conspicuous round hill of a dark hue; and while the church is visible above this hill the vessel will be in 8 fathoms; but when the church bears S.E., and open to the southward of three remarkable hillocks, the reef is passed.

Thynebierg Stone.

On the western side of the island the water shoals gradually up to 3 fathoms, which depth off the Thynebierg Stone is found at 1 or 2 cables' lengths from the beach; but to the southward of that stone there is a patch of rocks with only 5 feet water, which is separated from the island by a 2 fathoms' channel, and which is of course dangerous to small craft beating up along the island. Gniben, or Seierö Point, in one with the Thynebierg Stone leads close to the westward of this shoal, and to pass to the southward of it in 3 fathoms, Veirhöi must be kept open south of Seierö. On this last mark a sandy flat with 5 fathoms water will be found 1⅝ miles to the westward of Seierö Point, and separated from the shallow of the island by a channel, with 6 or 8 fathoms water.

On the south-west side of Seierö a harbour has been made accessible for the boats commonly used in the Great Belt. The harbour is formed by a stone pier in form of a crescent, extending from the beach, abreast of the church; the entrance, which is on the south side, is shut by a wooden pier leaving only

a very narrow inlet. The depth in the mouth of the harbour is 6 feet, but it is to be dredged out to 8 feet. In making for this harbour, attention ought to be paid to a rock, with 4½ feet water, lying 50 feet to the eastward of the outer pier-head.

229. On the eastern side of the island, the bottom in general is gravel; the best anchorage is abreast of the church, in 5 to 7 fathoms mud and sand, the church bearing S. by W., and the N.W. end of the island W. by N. In the bay to the southward of Kongshöi, between the shore and the reef, there is with westerly winds a good stopping-place; but if the wind should happen to shift round to E.N.E. suddenly, it would be difficult to weather the reef, especially with a flood tide, which runs across it to the southward. *Anchorages.*

230. The bay to the northward of Ordrup Ness is quite clear, and as the water gradually shoals towards the shores, they may be approached by the lead; but as an anchorage it ought only to be attempted by vessels provided with ground tackle sufficiently strong to ride out a N.W. gale, frequently a hard one in these seas, and to which the bay is entirely exposed. The best anchorage is abreast of Oddensby village, in 3 to 4 fathoms, remarkably good holding-ground. *Seierö Bay.*

The northern shore of this bay is the remarkable neck of land called the Siælland Odde, which terminates in Siælland Point, and the projecting form of which seems to announce the long range of reefs and shoals that extends from it to the northward, viz., Siælland Reef, Schultz Ground, Hastens Ground, and Briseis Flat. *Siælland, or Gniben Point.*

From the extreme point, which is about 60 feet high, and sometimes called the Gniben, Siælland Reef stretches 5 miles N. ¾ W. It is divided into three parts by two narrow channels, the Snekke-löbet and the Yder-löbet; löbet signifying channel. To guide vessels through these channels, pilots are stationed on the Gniben, though it is often impossible for them to get out. *Siælland Reef.* *Pilots.*

231. The inner, or Land Reef, is a narrow ridge of large rocks, nearly 2 miles in length, with from 3 to 7 feet water, and of course the surf is visible with the least motion of the water. About 140 fathoms from the shore, there is a 5-feet boat channel across the reef called the Seierbo Pass, but there is no leading mark for it, and the only directions that can be given will apply also to the two other channels, viz., that the agitation of the water *Inner Reef.* *Seierbo Boat Passage.*

is less in them than on the reefs; but it may be added, that being in a boat in the Seierbo, the eaves of the roof on the outermost house on Gniben Point are just visible above the cliff; and further, that the curling of the water is always on the opposite side of the reef to that on which the current strikes. Thus, during the flood tide, when the current sets to the south-westward, the chief rippling is on the western side of the reef, whereas during an ebb tide it is on its eastern side.

Snekke or Skude Channel.

232. Snekke-löbet, or Skude-löbet, separates the inner and middle reefs, and carries between 3 and 4 fathoms water, with a pretty clean sandy bottom, particularly on its south side. However, midway the bottom is more rocky, and abreast of its eastern entrance, a rocky ridge projects and extends along the reef, having on its outside, on the flat from the middle reef, several shoal patches; the northernmost of these carries 12 feet, and one more southerly, with 16 feet water, lies about 830 yards E.S.E. ½ E. from the south edge of the middle reef.

Beacons.

As a guidance to vessels employed on the home trade using this very important channel, two floating beacons have been placed, one on each side of the channel. The southern beacon, with one broom tied downwards on the top of a white pole, lies in 15 feet water, at the north side of the inner reef; from it Veirhöi bears S. ½ E. and is seen over the middle of the low saddle-land, between Gniben Point and Revhumpel:—A short distance to the northward of this beacon, there are 15 to 16 feet water. The northern beacon having one broom tied upwards on the top of a red pole, lies in 4 fathoms, close to the south side of the middle reef, and about 690 yards from the south beacon which bears S.S.E.

In the deepest part of the Snekke Channel there are 4 fathoms water, which depth, on coming from the westward may be retained through the channel, by steering E.S.E. ½ E. about midway between the beacons, but nearer to the northernmost until abreast of the southern beacon, and from hence steer S. E. between the two flats which project from the middle and inner reefs. In this channel the water appears of a darker hue.

In making the Snekke Channel from the eastward independent of the beacons, keep Lumbsaas mill a short distance open to the westward of two conspicuous hillocks on the high land at Ebbelykke, until the space between the mill and the hillock

nearest to it appears a little wider than that between the two hillocks; this mark leads along the N.W. side of the flat from the inner reef in 3 fathoms water, and in a line with the southern beacon at the channel. Coming from the W. and S.W., a vessel may enter the channel, by keeping Seierö church midway between the mill to the northward of it, and a conspicuous pointed hill to the eastward of the mill. In the event of these marks or beacons not being seen, approach the edge of the flat from the inner reef by the lead, and keep along its western side in 3 fathoms, but on its eastern side in somewhat more depth, until it deepens to 4 fathoms in the Snekke Channel, however, in doing this, care must be taken on the eastern side to avoid a small rocky patch with only 12 feet water, which lies in 18 feet about 414 yards off the reef, and about two thirds of its length from the point. On the western side, W.S.W. from the outer extremity of the inner reef, about 2 cables' lengths off, there is another rocky patch of 12 feet.

The mark for being abreast of the eastern side of the channel is: Veirhöi in one with Lille Revhumpel; on which mark the vessel will be close to the eastern side of the reef, between it and the above-mentioned rocky ridge: with Veirhöi open to the westward of Gniben Point, she will be close to the western side of the reef.

In the Snekke Channel, a regular tide exists in settled weather. *Tides.* It is observed in the channel to the northward of the reef, and is felt at a distance of 2 and 3 miles along the coast of Siælland towards Ise Fiord, and likewise towards Nexelö.

233. That part of the reef between the Snekke and Yder chan- *Mellem or Middle Reef.* nels which is named Mellem Revet, or the middle reef, consists of a narrow ridge of rocks; but on this part of the reef the depth is from 7 to 10 feet, and in some spots 2 fathoms.

234. Yder-löbet, or the outer channel, separates Mellem Reef *Yder or Outer Channel.* from Yder Reef; it is distant 2½ miles from the Gniben, and has not less than 12 feet water, but the south end of the Yder, or outer reef, locking with the north end of the middle reef, makes the passage crooked, which with its narrowness renders it necessary to have a fair wind. Coming from the eastward, and being abreast of the Mellem Reef, it is necessary to steer 2 or 3 points more southerly, to round the south end of the Yder Reef; the depth will then soon increase from 3 to 4 fathoms, clean sandy

bottom; and coming from the westward, it is of course necessary to keep a more northerly course in order to round the Mellem Reef.

Yder Reef.

235. The direction of the Yder Reef, outside the Yder Channel, is nearly two points more westerly than that of the reef inside of it. On this outer reef there is a spot with one large rock named the Rönnen, which is dry, with a common waterstand; it is fully 4 miles from the Gniben, and is covered with pebbles and sand which are washed away by high water. On the Rönnen stands a beacon, with a black and white striped ball, 5 feet in diameter, and 26 feet high, and under this a wooden cross. The outer division is thus the shallowest part of the whole reef; inside of the Rönnen it consists of a narrow ridge of rocks, with flats both sides; outside of it the reef is shallower and broader, with many rocks visible at low water.

Rönnen, a dry Shoal on the Reef.

Rönnen Beacon.

The outer extremity of the reef may with safety be approached by the lead, but not nearer than in 5 to 6 fathoms; during the night, or in foggy weather not within 7 fathoms, and if the vessel is going fast, not within 8 fathoms. Off the end of the reef there is a floating beacon, with 2 brooms, in 5 fathoms water.

Siælland Beacon.

On the eastern side of the reef there are several ledges of rocks, with 2 or 3 fathoms water; between them and the reef 3 or 4 fathoms. On the western side the water shoals more gradually, but abreast of the Rönnen the change is sudden from 8 to 4 fathoms; and on the flat off the Rönnen there are rocks with only 2 feet water nearly at the distance of a cable's length.

Anchorages off Siælland Reef and Point.

236. The anchorage in the channel Snekke-löbet may be used in settled weather, but as the least breeze raises the sea, especially when wind and current are opposed, this anchorage is by no means to be recommended, whereas good shelter against winds from N. to E.S.E., is to be found to the southward of Siælland Odde in 5 fathoms, Yderby mill bearing E. by N., or E.N.E. If the wind is more southerly, the anchorage west of the Gniben in 4 to 5 fathoms is to be preferred, though the holding-ground, consisting of gravel and sand, is not the best. With all southerly and westerly winds as far as N.W., the anchorage on the east side of the point is very good in the bay between Yderby and the Gniben, in 8 to 9 fathoms. The shore along this bay is steep-to, but inside of 8 fathoms the bottom is sand, whereas outside of that depth it is excellent holding-clay, and for this reason vessels ought not to come to an anchor nearer to the beach.

With N. and N.W. winds the north side of Siælland Odde is entirely exposed; but if a vessel be obliged to ride it out there, the best anchorage is half-way between the Gniben and Yderby, in 9 fathoms excellent holding-ground.

Coming from the westward, the course from Siælland beacon should not be to the southward of east before Veirhöi is in one with Gniben Point, which is the mark for being past the N.E. flat.

237. Schultz Ground is nearly half-way between Siælland Reef and Hastens Ground; it has but 11½ feet on its shoalest part, besides being steep-to on its south side; and on the north and east sides, at the distance of 2 and 3 cables' lengths, there are some rocky heads with 13 feet water. A cable's length to the northward of this dangerous shoal there is a floating beacon with a pole, with a ball above a broom. From the shoalest spot Ellemandsbierg is seen just behind the north end of Hielm Island; and Veirhöi is quite open to the west of the Gniben. It is therefore clear to the eastward when Veirhöi is open to the eastward of the Gniben; and to the southward and northward when Ellemandsbierg is open south or north of Hielm Island. *Schultz Ground.*

The channel between Siælland Reef and the Schultz Ground is 4 miles across, with from 10 to 19 fathoms. It is deepest in a N.N.W. and W. direction off the outer extremity of the reef: at 1 to 3 miles off it there are from 16 to 20 fathoms, sleek and clay. Hielm twice its own length to the northward of Ellemandsbierg is a good leading mark through this passage. In clear weather a good mark for passing to the westward of Schultz Ground in 6 fathoms is the pilot's house at the Gniben in one with the beacon on the Rönnen. *Schultz Channel.*

238. The Hastens Ground lies nearly 3 miles to the northward of the Schultz. It consists of three small dangerous flats, separated by narrow channels, with rocky patches on each of them; viz., on the southern flat two patches with 11 and 7 feet water; on the middle flat one rock with only 5½ feet, the shallowest spot on the shoal; and on the northern flat a cluster of rocks, with 8 feet water near its south end. These two last-mentioned are only 340 yards asunder, but they are separated by a deep-water channel, with 3½ to 4 fathoms water. *Hastens Ground.*

Close to the south-west side of this shoal there are 5 or 6 fathoms water, and towards that side vessels ought not to come within 7 or 6 fathoms by the lead; but to the other sides they

may in daylight approach within 5 fathoms without danger. In this depth the bottom all round the shoal is sand; inside of 5 fathoms its depth suddenly changes to 4 fathoms, and to 2 fathoms close to the rocks. During the night, or in foggy weather, do not stand nearer than 7 fathoms, especially on the western side. Off the south end of Hastens Ground there is a floating beacon in 5½ fathoms, with a striped pole and a red ball. Both this shoal and the Schultz may be considered as a continuation of Siælland Reef.

Hastens Channel. In the channel between Schultz and Hastens Grounds the depth is, with the single exception of a spot with only 21 feet, about half a mile to the northward of the former, from 5 to 7 fathoms fine sandy bottom with broken shells; but along the western side of the Hastens there are 9 fathoms, fine sand, increasing to the westward to 13, with sand and mud, and to the southward to 16 and 20 fathoms, with clay, which is found also N.N.W. and W. from the spit of Siælland Reef, and at a distance from 1⅓ to 3 miles.

Briseis Flat. 239. As a still further prolongation of this range of shoals, though in a rather more easterly direction, may be considered the Briseis Flat, first discovered during the last war by Captain Ross. This is a long sandy flat on a rocky bottom, at both its southern and northern extremities, and carrying only 4 fathoms water. The shoalest spot is in 56° 19½′ north latitude, and 11° 19′ E. of Greenwich, bearing S.E. by E. ½ E. from Aalsö church in Jutland. From thence the bank stretches about S. ½ E. 2¾ miles, with a breadth of only a quarter of a mile, between the depth of 5 fathoms on both sides. On its shoalest part it has from 21 to 23 feet, which bears S.E. by E. from Aalsö church. To the southward of the bank the bottom consists of brown sand with black specks, and between it and Hesselö there are from 10 to 13 fathoms, with soft bottom near the bank, but sand and foul ground near and about the north-west reef of that island.

Gniben Point. 240. The northern coast of Siælland, from Gniben Point to the mouth of Ise Fiord, is alternately high and low; the Gniben is about 60 feet; Yderby mill, Oddensby church, and Lumbsaas mill, being on the high land, are conspicuous objects, and further to the eastward Nykiöbing church, with a mill close by, and Rörvig church.

The shallow along the coast from the Gniben to the point of Klintsbierg does not extend far off, and gradually shoals towards the beach, with a rocky bottom generally. The depth increases very soon to 7 and 8 fathoms, with an uneven bottom of fine sand, with black specks or coarse sand and pebbles. Abreast of Oddensby church lies the wreck of a line-of-battle-ship. *Klinte Point.*

Nearly E.N.E, 9 cables' lengths from Klinte Huk, or Klintsbierg Point, there is a rocky shoal, extending 3 cables' lengths, with a depth of 14 feet, and close inside and outside 4 fathoms.

241. Nyrup Bay, between Klinte and Korshagen Points, is in general very foul, with 3 to 4 fathoms water and numerous rocks. *Nyrup Bay.*

About midway in the bay, E.S.E. 2½ miles from Klinte and two-thirds of a mile off shore, is Skierebek Reef, the length of 3 cables, with only 4 feet water on the shoalest part, whereas inside the shoal there is a depth of 3 fathoms. *Skierebek Reef.*

242. The entrance to the large inlet called Ise Fiord is 2 miles across from Korshagen to Spotsbierg, near each of which points there is a remarkable hill, the latter being the most conspicuous. Inside, it branches off into the two long fiords of Lamme and Roeskilde, besides the deep bays of Nykiöbing, Holbek, and Bramsnæs. The great extent of this inlet produces more regular tides than on any other part of the Kattegat shores when the weather is settled, but when boisterous, both flood and ebb continue to run for twelve hours, and even more, without changing. The hour of high-water at full and change at Rörvig is 11 h. 32 m. P.M.; at Holbek, 1 h. 9 m. A.M.; and at Frederikssünd, 2 h. 37 m. A.M.: the mean vertical rise is 9 inches, but during stormy weather may amount to 3 or 4 feet, and even more. *Ise Fiord.*

243. Off the mouth of Ise Fiord there is a kind of bar, consisting of different sandbanks, named Grönne Revle, Terskelen, Store Sand, Middel Ground, Ave Sand, Indre and Ydre Knæs, Tolken, Han Revle, Lyeness Sand, and Korevlen. A minute description of these different shoals would perplex the navigator and be of no use, because these sandbanks, owing to the nature of the bottom, are liable to shift; and although it has been ascertained that the depth in the mouth of the fiord during the last 150 years has rather increased than the contrary, yet it likewise appears that the channels are continually changing. The following general account of them will be therefore sufficient.

Sætteriet Road.

244. The shoals in the mouth of the fiord form an excellent roadstead, named Sætteriet, where vessels drawing more than 10 feet are obliged to anchor, and, if bound further up, to discharge part of their cargo, so as to enable them to cross the shallows inside.

Grönne Revle Shoal.

Coming from sea, and running for the above anchorage, care must be taken to avoid the outermost shoal, Grönne Revle, extending between N.E. and N.W. 2 miles from Korshagen Point, with which point and its shallow as far as Indre Knæ, it is connected. In several places on this shoal there are rocks with only 9 or 10 feet water—on one of them not more than 6 feet; and N.E. 1½ miles from Korshagen there is another with only 4 feet, the marks for which are, Thorup church, between Kikhavn and Store Væg, a high and bluff part of the shore at Tidsvilde, and Rörvig mill open to the eastward of the shore. To stand in to the anchorage at Sætteriet, Spotsbierg Point may be boldly approached, there being 4 fathoms within 1½ cables' lengths off the beach.

Entrance to Ise Fiord.

245. The mark for the entrance is to keep a large rock on the northern side of Spotsbierg, in one with the chimney of the westernmost house there, until Rörvig church is in one with the beacon, or until the mouth of the Roeskilde Fiord becomes visible south of Lyeness, when the anchor may be dropped in 2½ to 3½ fathoms good holding-ground. In entering, attention must be paid to avoid a small detached flat with 12 to 13 feet water, from which Rörvig church is in one with Steenhöi, the hillock a short distance to the northward of the custom-house, and the beacon. Larger vessels ought to hug the eastern shore as much as possible before arriving on the last-mentioned mark.

Eastern Channel.

The eastern shore being quite clear, it is possible, during the night, to approach it by the lead, provided it is not too dark to get a sight of the hill of Spotsbierg, and, passing it in a convenient depth, to anchor in 3 fathoms. On Spotsbierg there is a Fixed light, which may be seen in all directions to the north of E.S.E. round to S.W. by W., and which being elevated 123 feet, is visible 10 miles. The lighthouse though only 10 feet high, yet being whitewashed, may serve as a good daymark. After having passed the flat and brought Rörvig church in one with the middle of the southernmost sand-down, which is situated

Spotsbierg Light.

to the northward of the custom-house, you may anchor in 3 to 4 fathoms, sand, but good holding-ground.

This road is entirely open to the winds from N.W. to N.E., but the force of the sea is somewhat abated by passing over the extensive banks outside, and vessels therefore drawing too much water to proceed farther in, may ride tolerably well here. The shifting of the tide makes it advisable to carry out a kedge to prevent the anchor from getting foul.

246. Pilots for going in reside near the entrance to the fiord, close inside Spotsbierg creek; and at Rörvig for taking charge of vessels bound farther up the fiord. The Rörvig pilots, however, occasionally meet vessels outside, especially when a signal is made from Spotsbierg that the pilots there are prevented from getting off by stress of weather. Under such circumstances vessels are sometimes obliged to wait a very long time for the arrival of the Rörvig pilot. Every vessel bound to Rörvig is liable to pay pilotage, whether taking a pilot or not, except those drawing less than 4 feet and being Danish property, or belonging to nations privileged equally with the Danes. *Pilots.*

There are pilots at Holbek, Frederikssünd, and Roeskilde, who carry vessels to the different places in the fiord, except Frederiksværk, of which the Rörvig and Kikhavn pilots have a monopoly. Vessels not employing a pilot have to pay, at Roeskilde, 4 rbsk. per foot draught, whether inward or outward bound, for the marks; at Frederikssünd, 2 rbsk. per commerce last of every vessel that is measured and stamped; and the Rörvig pilots are paid by every vessel 4 rbsk. per commerce last for the marks in the channel to Frederiksværk each time that a vessel passes this way without a pilot.

247. From Sætteriet road different channels lead into the fiord, of which the widest crosses the bar between Trind Sand on the southern extremity of the Middel Ground on the western side and Lyeness until nearly due south of the Skandse Point on the eastern side. This channel has a variable depth of 9 to 14 feet, and the deepest water is to be found along the east side of the Middel Ground, but it is at the same time the most changeable. Vessels drawing 9 feet have room enough to beat through this channel. To clear Trind Sand, which is steep-to from the depth of 6 feet, two remarkable lofty trees on the southern border of Ulkerup Wood must be kept in one with Nakke Point. *Trind Channel.* *Trind Sand.*

104709

Rörvig Road. 248. Besides this channel, which leads into the midst of the fiord, there are two other ones leading to Rörvig Road, in its north-western corner.

Terskelen Channel. One of these channels leads directly in from the sea to the road across the sandbank Terskelen Sand, to the northward of the Store Sand: its depth is in general 12 feet, except in one spot, where there are but 10½ feet; and it would seem that the depth is increasing in this channel, so that it is at present the principal entrance.* The mark for it is the beacon (a pole with a triangle on the top), to be kept moving between Rörvig mill and a pole with a square board, which has lately been substituted for the northern mill; the course upon this mark is W. ¼ S. or W. by S., and the deepest water will be found when the beacon is in one with the new staff.

Beacon.

On Nakke Point there is a hummock, with a hedge in an east-and-west direction, and when Egebierg church is between this hummock and a hill N.W. from thence with a house and some trees, the above mark is kept with a S.W. course, it leads along the west side of the Store Sand, until abreast of Skandse Point, when you may allow the church to come in one with the house, but not after having passed the point. When a large willow, between Rörvig beach and Nakke Point, appears between Sodehöi and the adjacent Fruens Huus, then stand on upon this mark between the Middel Ground and the Tolken: but if it be necessary to make a tack, the willow may be allowed to wander between the two last-named objects. The Tolken shoal is passed when the new staff carrying a square board is just in one with Rörvig village, and you may then run for the anchorage in the roadstead off Rörvig, in 5 or 6 fathoms, the bottom bluish clay.

Smöget Channel. 249. The other channel, named Smöget, or Kirkelöbet (the Church Channel), was formerly the deepest, and its direction is N.W. and N.N.W. from Sætteriet to Rörvig Road, leading between the Store Sand and the Middel Ground. The depth of this channel is decreasing, having now in its shallowest part only 9½ feet; but it has the advantage, compared with the deeper channel across the Terskelen, of having with strong N.W. and N. winds smooth water under the lee of the Store Sand. It is, however, difficult to use unless with a leading wind, being very narrow,

* View 16.

and bending northward at its western extremity, just where it has the least water. The course through it is N.W. by W. ½ W., keeping Rörvig church in one with the flag-staff on the quay at Rörvig, and minding to heave the lead. After passing the south end of the Store Sand, the course is N.N.W., which brings the church near a willow that stands close to the northward of the northernmost house on the western shore—the comptroller's house, a regular brick building with three symmetrical chimneys. When on this last mark, you will be steering W.N.W., just clear of the north end of the Middel Ground, on which there are but 3 feet, and towards the deep-water channel, until being in the above-mentioned mark—the willow between Sodehöi and Fruens Huus, and then steering for the road according to the directions given before.

250. If bound from Rörvig to the southward, and farther up the fiord, Steenhöi is to be kept in one with the north end of the head pilot's house, formerly that of the custom-house officer, and the southernmost of the custom-house buildings. This is the leading mark to pass between the Han Revle, a shallow along the western shore, and Ave Sand on the eastern side, which last shoal is passed when Rörvig church is visible to the southward of the village. This mark likewise leads to the southward of the rest of the shoals before mentioned. The common depth in the spacious parts of the fiord is 5 to 6 fathoms.

251. Inside the Terskelen there is a good roadstead between the Store Sand and Indre Knæ, a shallow extending off the Skandse Point, and better sheltered against northerly winds than the roadstead at the Sætteriet.

252. The Western Channel is between the Terskelen and Korshagen; and though it has 10½ feet water in its shoalest parts, it is difficult to use, being only 40 feet wide, and destitute of good leading marks, and with gales of wind from N.E. to N.W., subject to a heavy sea, as the waves roll in over the extensive flat between the Terskelen and the shallow off the shore. With the mark Egebierg mill in one with Krog-hage battery, steering S.W. ½ W., you may pass across the flat, with 13 feet water off Korshagen; then S. by W. is to be steered, round the west side of Ydre Knæ, which is passed when the flagstaff at Rörvig opens beyond the battery; and from this mark, as far as the deep-water

Western Channel.

channel inside, the shallowest part will have 10½ feet. Again getting in 4 fathoms, then follow the before-mentioned mark for leading between the Middel Ground and the Tolken.

With the assistance of a pilot in running in, it is not necessary to pass round the south end of the Tolken (the shallow extending off Skandse Point), as three ways across this shoal lead to Rörvig Road. The northern one, the Skandse Channel, between Skandse Point and the Tolken has, where it is shoalest, 14 feet, but it is extremely narrow and crooked.

Passages across the Tolken.

253. The northern passage across the Tolken has 9 feet water, and the mark for it is, Rörvig mill in one with the stunted trees, at the north side of the village. The southern passage across the Tolken has 10 feet water, and the mark for it is, the new staff carrying a square board in one with the northernmost houses in the village. Inside of Skandse Point ships may winter, if required, mooring by one anchor on the shore and another to seaward; the holding-ground, however, though consisting of sand and mud, is but indifferent.

The Bredning, or broad part of the Ise Fiord.

254. When inside of all the shoals Ise Fiord is very spacious, and is therefore called the Bredning; it has from 5 to 6 fathoms water, sand and seaweed, and in some places sleek. It contains, however, two insulated shoals, one being two-thirds of a mile to the northward of the north-west point of Ourö Island, extending a mile to the northward, and nearly a mile from the beach of Kongsöre. The other shoal lies W.N.W. ½ W. off Jægerspriis palace, about 3 miles off the beach, and 2 cables in length.

Both of these shoals consist of sand and seaweed, with occasional rocks; but as their least depth is 12 feet, they cannot be considered as dangerous to the navigation of the fiord.

Nykiöbing Bay.

255. In steering for Nykiöbing Bay, care must be taken to avoid the rocky ledge called the Rönnen, extending 2 cables' lengths off Nakke Point; on its outer extremity there are only 2 feet water, and it is steep-to in 4 fathoms. To pass it to the southward, keep Troldbierg open to the southward of the wood of Grönne Have, (and this mark leads likewise to the southward of the bank off Ringholm), until Nykiöbing church is just in one with the pier, which then may be approached by steering N. ½ E. the bearing of the last-named mark.

This pier forms a harbour, with 6 to 8 feet water inside the

pier-head; but only one vessel may come alongside at a time, and as it is open from S.E. to S.S.E., it affords no shelter against the sea, which in blowing weather may be considerable there.

With the mark Troldbierg in one with the northernmost magazine at Anneberg, you may run for the anchorage midway in the bay, a little to the northward of Anneberg, in 3 fathoms, soft bottom.

256. A branch of this great fiord, named Lammefiord, leads to the roadsteads of Faareveile and Asnæs, but they are not much frequented. To enter it, the course is W. by S., close to the southward of Kongsöre Point, but keeping Kundby church in one with the outermost point of the cliff to the northward of Hagested church until Egebierg church and mill are in one, which mark leads half-way between Egenæs and Kidserup rocky shallows. *Lammefiord.*

To pass the shoals off Lyngholm Point the course is N.W. by W. ½ W., and N.N.W. ½ W., between Storö and Asnæs Point. Up this inlet 12 feet may be carried till Höve mill comes in one with Asnæs church.

Further in, between the small islands Storö and Flinteholm, on the south side, and Inderö on the north side, the water shoalens gradually to 7 feet, half a mile S.E. from Faareveile Beach; the bottom being soft, with sea-weed of prodigious growth. To the southward of Storö there is another channel to Faareveile Road; but at the east end of Storö, and along the south side of the bight, there are several reefs, and therefore the northern passage is to be preferred. *Faareveile Road.*

257. Inside of Kongsöre Point there are some good anchorages. *Kongsöre Point.*

1. On the flat off that point, in 15 feet water, sandy bottom.

2. In the little bay to the westward of Tudse Point, the shore there may be approached in a convenient depth up to 9 feet, and vessels may anchor anywhere on a sandy bottom. From this place a ferry crosses over to Kongsöre Point.

3. To the westward of Egenæs Point, abreast of Atterup, there is anchorage in 12 to 18 feet, sandy bottom, 2 cables' lengths off the point. *Egenæs Point.*

4. To the eastward of Lyngholm there is a good anchorage in 12 feet, sand. *Lyngholm Point.*

5. Inside of Asnæs Point small craft may find anchorage, by keeping Höve mill in one with the east side of a remarkable hillock near the beach until Asnæs church opens to the northward *Asnæs Point.*

of Asnæs Point; this last mark leads along this neck of land, and inside of it anchorage may be had in 6 feet, soft bottom, with sea-weed.

Gislinge. 6. On the south side of Lammefiord vessels may anchor in a small bay to the northward of Gislinge, in 9 to 10 feet water; but in the rest of the fiord, either the shores are rocky or the bottom is too soft and too much overrun with sea-weed to afford any good holding-ground.

Ferry. 258. A ferry has been established between Lyngholm and Andebo on the opposite shore, which was very necessary, as the ferry between Kidserup and Kongsöre is too small to carry horses and waggon.

Ourö. 259. On the shallows off Ourö there are some rocks, particularly on the north side of the island. From its north point, Næsby Reef extends 4 cables' lengths off, into 13 feet water, the mark for which is Holbek church in one with the north-westernmost house on Ourö. Off the adjacent point of Borre Head there is another reef, extending N.N.W. 3 cables' lengths, and partly visible above water. The mark for its north end is Holbek church, open to the northward of the north-west point of Ourö.

Ourö Channels. On both sides of Ourö, passages lead to Bramsnæs and Holbek Bays; the western one is recommended as being the deepest and widest, and the nearest to Holbek. To enter this channel, the course along the west side of the shoal is S. by W., and the mark for clearing it is, to keep Ourö mill just open to the westward of the north-westernmost house on Ourö. When in the channel, attention must be paid to steering between the two sands, the Skinkelmær and the Hönsehals; the first extending off Ourö, and the latter from the opposite shore: the edges of these shoals are steep-to, and in the direction of the western side of Dragerup wood, in one with Bognæs Point. The vessel must be kept a little to the eastward of that mark until the Skinkelmær is passed; and when Bybierg church and mill are nearly in one you are half-way between the shoals, North and South, and must steer more easterly, so as to open still more the above mark in order to pass the Hönsehals. Then the course is about South, keeping mid-channel, in from 4 to 10 fathoms, until the southernmost of two remarkable hummocks, to the northward of the village of Vellerup opens to the south-

ward of Ourö, when you may steer W. ¼ S. towards Holbek, passing Kirsebær Point in 12 feet. Holbek Harbour is formed by two piers in a northerly direction, which make it very safe, even during winter. The harbour has 11 feet water. N.N.E. a cable's length off the pier-head, there is a buoy for making fast to, when required. *Holbek Harbour.*

260. At Holbek there is a pilot, who is bound to take vessels to Rörvig, Bramsnæs, and Vellerup Creeks, or to any other place in the Ise Fiord, but he is paid only when employed. *Pilot.*

The harbour-money is 4 rbsk. per last, whether in or outward bound. *Dues.*

From Holbek a ferry crosses the fiord to Tudsenæs, for which each passenger pays 4 rbsk. *Ferry.*

261. The channel to the eastward of Ourö has a depth of 18 feet, but is extremely narrow. To enter it between the reefs of Kundby and Næsby, Rörvig church is to be brought in one with a remarkable willow-tree in the field near Rörvig; and on this mark steer about S. ¼ E., towards Næsby, where the channel runs S. by W., and S. by W. ½ W., along the east side of the island of Ourö, until Holbek church opens to the southward of the island, when the channel changes its direction to S.W. by W., round Hammer Point, off which a reef extends two-thirds of a cable's length. After having passed this reef, the course is again S. by W. ½ W., along the west side of the Hammer, and between it and the little island of Rönö.

At the south point of Ourö there is a sort of a pier, making a landing-place for boats; and a similar one is on the west side of the island, at Möllebro. *Landing places on Ourö.*

262. In the Inner Bredning, or the wide part of the fiord, there are from 3 to 5 fathoms, except on two shoals, of which the westernmost carries 9 feet water, and lies between the shore of Dragerup and the south end of Lindholm Island, half a mile from the latter, and in the direction of Holbek church in one with the northernmost mill to the eastward of that town. The other shoal, named the Dronninge Dyssen, consists of a patch of rocks scarcely a third of a cable's length across, and nearly dry, but steep from the depth of 18 feet. The marks are: for the west side, in 18 feet water, Bybierg mill on Ourö in one with a solitary shrub on Lindholm; for the south side, Holbek church a third from the north end of a little wood, west *Inner Bredning.* *Dronninge Dyssen Shoal.*

of Dragerup; and for the north-side, in a depth of 15 feet, Holbek church well open of the same wood. From the middle of this dry shoal Bybierg church is seen just to the westward of a large farm, in the vicinity of the hill Elnebierg, on Ourö; moreover, a little white house, the Deilighed, on the beach at the bottom of Bramsnæs Creek, will be seen just on the east side of Bramsnæs Point. Vessels bound from Holbek to Bramsnæs or Vellerup Creeks, when outside of Holbek Bay, bring Egebierg church open of Bognæs Point, with which mark they steer about S. ¼ E., and pass to the eastward of the shoals off Kirsebær Point; when nearly abreast of the north end of Dragerup wood, the course is changed to E.S.E. ½ E. across the bay, and they pass to the southward of the Dronninge Dyssen, according to the marks above given. Having rounded this shoal, they steer N.E. b. E. ¼ E. for Vellerup church, and so into Vellerup Creek, which is quite clear, and shoalens its water from 4 fathoms to 15 feet in the inner part of the creek. The landing-place is on the north side, close inside the point, where the bottom is sand; whereas in the midst of the creek it is soft ground and seaweed.

Bramsnæs Creek.

263. Bramsnæs Creek is formed by the small peninsula Bramsnæs, as shown in the chart. The harbour is clean, and has a depth varying from 4 fathoms to 15 feet, gradually shoaling towards the beach: the shoals outside, however, are steep.

A small reef extends 3 quarters of a cable's length off the northern point of Bramsnæs, and its extremity is quite steep-to in 4 fathoms. Deilighed house kept open to the eastward of Bramsnæs Point, and steering about S. b. W. ½ W. and S.S.W., will lead into the middle of the harbour, where the bottom is extremely soft, with long seaweed, and, of course, indifferent holding-ground.

Alholm.

264. The little island of Alholm, in the northerly part of Ise Fiord is connected with the shore by a sand-flat, just covered by an ordinary water-stand. From off its south end a reef projects S.W. ½ W. two-thirds of a mile, with 11 feet water on its extremity. The mark to clear it is, Rörvig church in one with some willows in the middle of Rörvig village. Inside of this reef, in the bay, under the island, there is an anchorage on the shallow.

Roeskilde Fiord.

265. Kulhus Channel is the entrance to the fiord of Roeskilde, another branch of the Ise Fiord, and leads to the roadsteads of

Frederiksværk, Frederikssund, and Roeskilde. The narrow channels or canals to the eastward of Kiölholm, and to the westward of Eskildsö, permit vessels drawing less than 10 feet to proceed up to Roeskilde. They are dredged out to a depth of 10 feet, and 40 feet wide, and are pointed out by marks. Owing to the numerous shoals, and the narrow intricate channels, it is not possible to navigate this inlet without the assistance of a pilot, and, therefore, a more minute description here would be of no use.

Spotsbierg to Gilbierg Head.

266. The coast of Siælland, from Spotsbierg to Gilbierg Head, is quite clean, and the narrow bank along the shore is all sand, except off Tidesvilde, where it is rocky. From Kikhavn to the high, whitish cliff of Lillevæg, and again from Liseleie to Tidsvilde, both of which places are the abodes of fishermen, there is a shelf, with 22 or 23 feet water, at the distance of from 5 to 7 cables' lengths off the shore.

Rusteen Reef.

267. A short distance to the westward of the high land of Gilbierg Head, Rusteen Reef extends fully a cable's length off the beach, with only 3 feet water on its outer end, but 2 fathoms close to; but along the shore there is a somewhat deeper passage for boats.

Sætterierne Anchorages.

Coasters and small craft, which lie somewhat exposed in Hornbek Bay, in strong S.E. gales, may run out and anchor along this coast in 3½ to 4½ fathoms, off Raageleie, Tidsvilde, and Liseleie, commonly called the Sætterierne, which are anchorages.

268. The most remarkable objects are: Blidstrup and Græsted churches, both in elevated positions; and to the eastward of Gilbierg Head, Gilleleie church, near the beach, with a small spire; and the two Lighthouses at Nakke Head. Blidstrup and Græsted churches are built in the style common to Danish country churches; but the former is shorter than the other, and close to it stand some trees.

CHAPTER IV.

ISLANDS AND SHOALS IN THE KATTEGAT.

269. In its length from north to south the Kattegat has a range of islands, forming as it were parts of the same ridge:—Læsö with large surrounding shoals; Anholt with similar reefs and shallows; and Hesselö along with the adjacent Lyse Ground.

Læsö Island. Læsö is the northernmost and largest, and at the same time the most dangerous, being extremely low, and surrounded by extensive reefs and flats. The most elevated objects on the island are the sand-downs along the northern shore, of which those in the middle, being the most conspicuous and peaked, are named the Highsands, as they rise to nearly 100 feet. Their eastern end is near Syr Point, where they are called the Jegen Hills, about 30 feet in height, and the Danzigmand further eastward, about 34 feet; the latter is long and even, but with a remarkable deep cut, by which it is easily recognized. On the western side stands Vesterö, and to the southward Byrum church, the tower of which is 99 feet high.

North Rönner and Cays. 270. From the N.W. point of Holtem, a reef extends more than 4 miles to the North Rönner, which consists of two large cays, the Langholm and the Spiirholm; and two smaller ones, the great and little Steenholm, together with the Bourfeld Reef. The Bourfeld generally covers at high water; this never happens to the other cays, which are partly overrun with grass, and even carry a few bushes. The easternmost is the Langholm, 7 or 8 feet above water; and the westernmost is the Spiirholm, only 5 or 6 feet high, and between them there are numerous rocks that show above water; nevertheless these two cays, along with the Skude Reef to the westward, form a harbour for boats called the Dammen, with 6 feet water and a northern entrance.

Langholm Cay.

Dammen Boat Harbour.

On the Spiirholm, a small round turret of brickwork has been erected for a beacon; it is formed like a large sentry-box, and its top being 30 feet above the level of the sea, it may be seen from 7 to 8 miles. In this turret a few shipwrecked people might find a refuge, and hard by there is the only drinkable water on this dreary spot. *Spiirholm Beacon.*

N. by W., a mile from this turret, the point of a reef rises from 6 fathoms water to 2¼ fathoms, and ought not to be approached nearer than in 7 fathoms. Farther westward is the Bourfeld, from which a large reef extends half a mile more to the westward with a depth of 2 to 3 fathoms, but steep-to. Nearly a mile from the Rönner, in 6 fathoms, there are two more reefs, with from 12 to 16 feet on them; and therefore, to avoid them all, the Rönner ought not to be approached any nearer than 1¼ miles. *Bourfeld Cay.*

The North Rönner is covered by hard sand, and may be plainly distinguished when far off by the tint of the water, appearing like a yellowish stripe. The connecting reef is all rock, and the shallowest spot is on the Holmbo, where there is but a foot and a half. On both sides of this reef there is a passage for boats, with 4 feet water; and the outer one which is 2 cables' lengths across, leads between Holmbo and Little Steenholm, and farther westward between Great Steenholm and Bourfeld, where the depth is 2 fathoms. The mark for the inner passage across the reef is to keep Vesterö church just open to the eastward of Holtem Point, the N.W. shoulder of Læsö. *Holmbo Reef.*

Between the Bourfeld and the Great Steenholm there is a deep bay, with a depth of 4 or 5 fathoms; and this bay, being W.S.W. of Spiirholm beacon, affords good anchorage, which easily may be found, guided by the beacon. *Bourfeld Anchorage.*

271. From Hornex Point projects the narrow North West reef, with only 2 feet water for the first 4 cables' lengths; but at 3 cables' lengths farther out there is a depth of 4 fathoms. The bight between this reef and the Rönner has a clean bottom, with 2 fathoms close along the shore. In a case of need, vessels may find a refuge in this bight; but as it is entirely exposed to the N. and N.W., and rather difficult to leave, it cannot be recommended *Hornex, or N. W. Reef.*

272. The north side of Læsö is safe from thence nearly as far as Jegen Point, the water gradually shoaling up to the depth of *Jegen Point.*

N.E. Reef. 4 fathoms, which is found at the distance of only 2 cables' lengths from the beach; but from Jegen and Syr Points, an extensive flat runs out 4 miles to the N.E., with less than 4 fathoms, and with two patches of 14 feet. As they are dangerous to navigation, a floating beacon, named the N.E. beacon, (Nordost Vager,) has been placed off the N.E. extremity of the shoal, and is the northernmost of the 6 beacons placed along the eastern shore of Læsö.

Off Jegen Point there are several small reefs close to the shore, to pass outside of which keep Holtem Point open N. of Hornex Point. The reefs carry only 1½ feet water, and they reach out two-thirds of a mile from the point.

Trindelen Shoal. 273. Nearly in the same direction as the North East Reef, or N.N.E. ½ E. from Syr Point, distant 6 miles, lies the small insulated and dangerous Trindelen. The surface of this shoal is 92 feet N.W. and S.E., and 74 feet across, with only 4 feet water. It consists of small stones not more than 6 inches in diameter; and outside of the small stones, to the distance of half a cable's length, large stones lie closely packed; while still farther out, to the distance of 2 miles, loose stones and rocks lie scattered here and there. This shoal is nearly steep-to on all sides; 4 fathoms water being found at the distance of half a cable's length all round it, except towards S.E. and S., where that depth is not nearer than at a cable's length.

Beacons. Two floating beacons are placed in 6 and 7 fathoms on each side of the shoal, the one W.N.W., two-thirds of a mile, with a broom on a white pole; the other, E.S.E., 4 cables' lengths, with a red ball on a red pole. Close to the eastward of this last beacon there is a 7 fathoms flat, on which a Floating Light is moored, bearing E. by S., two-thirds of a mile from the shoal.

Light Vessel. The vessel is schooner rigged, painted red with a white cross on each side, her light is elevated 31 feet above the level of the sea, and during the day she carries a red ball, 61 feet high, and tolls a bell in foggy weather. This light vessel is not allowed to communicate with other vessels, except in a case of distress. She takes her station on the 1st of March, if the sea is open, and leaves it on the 21st December.

The Trindelen may be passed all round, though in its vicinity there are some flats; but they are not dangerous, and may therefore be of use through the lead in foggy weather. To the west-

ward there is a range of them reaching as far as the North Rönner, and on one of them there is a spot with 23 feet only. It lies N.E. by E., nearly 3 miles from the Rönner; and on it, as well as between them, the soundings are fine grey sand. The general depth there is from 6 to 8 fathoms, whereas on the eastern flats, between this shoal spot and the Trindelen, the sand is a reddish brown mixed with gravel and stones, and the depth varies from 11 to 6 fathoms.

The Trindelen Bank, in a N.N.E. direction from the light vessel, rises suddenly out of the deep water, and the intermediate soundings are rock and gravel at very irregular depths. On that part of it which is called the Tönneberg Bank four distinct patches have been found:—1st, carrying 6 fathoms, N. 20° E. (*magnetic*), 2¼ miles from the light vessel.—2nd. 6½ fathoms, N. 25° E., rather more than 2½ miles from that vessel.—3rd, 7 fathoms, N. 28° E., nearly 3 miles from her.—And 4th, 6¾ fathoms water, N. 38° E., nearly 2½ miles from the same light vessel. *Tönneberg Bank.*

274. To the eastward of these banks, and separated from them by a crooked channel nearly 2¾ miles wide, with a depth of between 25 and 39 fathoms, suddenly rises the Kummel Bank, a name derived from the Kummel fish* taken here in August by the Swedish fishermen. This bank has an extent of 2 miles within the depth of 20 fathoms, over sand and gravel, interspersed in some places with pebbles of various colours, except in the two shoalest spots where the bottom is rocky. The northernmost of these spots, with 12 fathoms water, lies S. 49½° W. 11½ miles from Vingä beacon, and N. 77° E., 5 miles from the Trindelen light vessel. The middle of the southern shoal with 13 fathoms water lies S. 50½° W. from the same beacon, and N. 85° E. from the light vessel. The Kummel Bank, on its eastern side, falls very suddenly off from 10 to 25 fathoms in the channel along the coast of Sweden, where, between the Kummel and the Tislarn, 30 to 38 fathoms water will be found with sleek and blue clay, and within 5 miles of the latter rock there are 40 fathoms. *Kummel Bank.*

275. Bocher Bank bears S. by W. ½ W., 4 miles from the Kummel Bank, and E.S.E. ½ E. 5 miles from the N.E. floating beacon of Læsö; it is 3 miles in length, N.W. and S.E., and *Bocher Bank.*

* To what species of fish the author alludes is not known.

1½ miles across, with a depth varying from 12 to 19 fathoms; dark sand on the N.W. side, reddish sand and gravel on the E. side, and on the shoalest part gravel and stones. This ridge lies to the eastward of the bank, which curves round to the S.W., and is about 1½ miles in extent, and half a mile wide; its centre bears S.E. ¼ S. 5½ miles from the Trindelen light vessel, with the beacon Magazine at Læsö in one with Byrum church, which in clear weather is just visible from it. It falls off suddenly on the N.E. and S. sides to 25, 30, and 40 fathoms, with soft bottom; but on the W. side it slopes gradually to a depth of 20 to 27 fathoms, bluish clay, which is likewise found in all the deep water; while the shoals connected with the island of Læsö consist of find sand, and therefore the lead becomes a valuable guide to vessels beating about here in misty weather.

To the south-eastward of Bocher Bank there is a hole with from 40 to 52 fathoms water, and S. by E., 3 miles from it, another hole with 65 fathoms, muddy bottom.

Trindelen Channel.

276. If it be intended to pass between the Trindelen and the North East Reef, do not stand nearer in than 12 fathoms, unless the beacon is seen, for the flat is steep-to, and the northern 14-feet shoal is scarcely a mile from its extremity; and about a cable's-length farther in, in the direction of Syr Point, there is another shoal, having the same depth as the former. Small vessels only should attempt to cross the flat, and by those only who are familiar with the place; but it may be done, for to the southward of the 14-feet shoal, about the distance of two-thirds of a mile inside the extremity of the reef where the beacon is placed, there is a channel with 3 fathoms water and 2 miles wide. Syr Point ought not to be approached within 1½ miles without a pilot, for off this point are the Rusmand and the Tællemand Shoals, the first having 11 feet water, and the last N.E., about a-third of a mile from the point, with 3 feet only. From Osterby village pilots may be had, though not regular ones.

Pilots.

Shoals along the east side of Læsö.

277. Along the eastern side of Læsö there are numerous sand-banks extending far to the southward, especially the longspit called the Kobber Ground, which is considered one of the greatest dangers in the Kattegat, because from the deck of an ordinary vessel, when in the vicinity of its New South beacon, land can only be seen with a very clear atmosphere; whereas from the Kobber beacon, the next, Byrum church, with some trees, bearing N.W. ¼ W.

to the northward, are plainly distinguishable from the deck of a vessel 10 to 12 feet above water, as likewise the Highsands and two or three houses in the village of Osterby. To give warning of these shoals six floating beacons with red poles are placed along their eastern sides, viz.:—

The north-east Beacon, having 3 brooms, tied upwards.
„ Syr Point ditto, having 2 brooms, ditto.
„ Knallen ditto, having 1 broom, ditto.
„ Flynder ditto, having 1 broom, tied downwards.
„ Kobber Ground do., having 2 brooms, ditto.
„ New South ditto, having a red ball, and above this one broom tied upwards.

Though these beacons are carefully watched from the island, and replaced as soon as carried away by the ice or by accident, it would be dangerous to rely too much on their always being found in their proper places.

These beacons being 15 to 20 feet high, and not more than 2 or 3 miles apart, except the three southernmost, the distance of which from each other is somewhat greater, it is common in tolerably clear weather to see two of them at the same time. Vessels may pass a short distance inside of the 2d, 3rd, and 4th beacons; but this must by no means be attempted with the 5th and 6th at the Kobber Ground, as they lie close to the edge of the shoal, on which there are only 11 to 13 feet water.

278. To the southward of the Kobber Ground there is a shallow bank with only 4 or 5 fathoms, and 11 miles in length from the New South Beacon. There are several spots on this bank with 15 to 20 feet only; the southernmost of which knolls, though only a cable in length, falls abruptly off from $3\frac{3}{4}$ to 5 fathoms on all sides, and bears S. b. E. $\frac{1}{2}$ E., $6\frac{3}{4}$ miles from the above beacon of the Kobber Ground.

The old general rule, when standing towards the eastern side of Læsö, to tack in 7 fathoms, ought still to be observed, the shoals being too steep to be approached nearer than in this depth.

279. Inside the range of shoals, along the eastern side of Læsö, viz. the Knallen, the Flynder Ground, and the Kobber Ground, there is another range of shoals, viz., Steenknud, Knobe Ground, Skiollen, Mellem Flat, and Knæet. *Inner Shoals.*

Half a mile inside the south end of the Knallen there are 9 to 10 feet water, and about a mile from the house for the beacons,

Steenknud. on Syr Point, are the shoals Steenknuderne, with only 2 to 6 feet water, in the direction of Danzigmand eastern sand-down in one with the beacon-house. To pass outside this shoal, keep Danzigmand western sand-down in one with the beacon-house; and inside this shoal there is a channel with 8 to 9 feet water. To the southward of this shoal, with the Highsands bearing N.W. by W. ½ W., you may steer in that direction towards

Krogen Boat Harbour. Krogen harbour, which is a good boat-harbour, and likewise a safe place during the boisterous seasons for small vessels: this course bears directly for the inlet, which is pointed out by sticks carrying brooms, and having a depth of 4 feet.

Knobe Ground and Skiollen. The shoals Knobe Ground and Skiollen have only 1 to 1½ feet water, and between these shoals there is a small bay, the Aalebierg Deep; and likewise between Skiollen and Knæet another bay, Laaen Deep, both of which have 6 to 7 feet water, and afford during the summer season tolerably good roadsteads for small

Mellem Flat. craft, being partly sheltered by the Mellem Flat, which lies between the two ranges of shoals, and which has nowhere more than 2 fathoms, and a large portion of it only 5 to 7 feet water. This flat is separated from the shallow along the beach by a channel about two-thirds of a mile across, and rather more than 2 fathoms deep. Into this channel small craft may pass by bringing Byrum church to bear N. by W., and keeping this course towards the shallow along the shore abreast of Mellem Flat, till the water shoals to 11 or 12 feet; the course is then to be altered to E.N.E., through the channel, until the church bears N.N.W., when you will be abreast of Laaen, and may drop the anchor in 2 or 2¼ fathoms water, on good holding-ground, and without any sea of consequence, it being broken on the extensive flats and shallows. The worst winds are those blowing in the direction of the channel—E.N.E. and W.S.W.; but vessels may easily ride out a gale here, and if an E.N.E. wind should come on too violently, you may run behind Knæet, and lie well sheltered, as long as the wind is to the northward of east.

280. The shallows of the island of Læsö extend farthest out on the south side, and a vessel must be 1 or 2 miles inside the 4 fathoms line of soundings before Byrum church, which is 99 feet high, becomes visible, even with very clear weather; whereas under like circumstances the church may be seen from a boat when outside the Kobber Ground.

The Knæet is to be considered as a continuation of this extensive projection from the beach to the southward, and carries, at the distance of 6 miles from Byrum church, little more than 6 feet water, though somewhat more is to be found farther inside. *Knæet Flat.*

281. Nearly in the direction of this projecting point of the shallow, with Hornfisk (a little cay just above water) in one with Byrum church, about N. by E., and at the distance of 8 miles from the church, lies the extremely dangerous shoal called the Silde Rön, consisting of five patches of rock, extending N.N.E. and S.S.W., and a third of a mile in length. On the innermost, as well as on the third of these heaps of stones, there are 9 or 10 feet water; on the second and on the fourth 5 or 6 feet; while the southernmost is just visible above water. Between these patches of rocks there are from 15 to 17 feet, and all round from 18 to 21 feet; in one spot to the eastward, even 4 fathoms. Due south from the ledge the depth gradually increases, and the 4 fathoms line is distant only 1¼ miles from the shoal on that bearing, whereas towards the S.E. it is nearly 5 miles off. This shoal, which formerly was eminently dangerous to shipping, is now marked by a floating beacon, placed S. by W. a quarter of a cable's length from its southern extremity in 3 fathoms, and having one broom on the top of a white pole. *Silde Rön.* *Beacon.*

282. Nearly west from the Knæet there is another projecting point of the sands, called Brændevin Spit, which is almost dry at low water, and projects two-thirds of a mile from the dry bank. It may be considered as a continuation of the Kirke Ground, and even at the distance of 7 miles from Vesterö church the depth is only 6 feet, which decreases gradually towards the shore. Close inside the dry part of the shoal there are 7 to 8 feet water, and small craft may be well sheltered there with northerly and westerly winds. Outside of Brændevin Spit the depth gradually increases on a hard sandy bottom, so that it may be approached by the lead, which will find 2 fathoms at a third of a mile south of the Spit. The mark to pass Brændevin Spit is, to keep Vesterö church a little to the eastward of some remarkable rocks on the South Rönner, which are above water, and then, by steering E. by N. between the two points of the sands Brændevin and Knæet, you may lie well sheltered in all winds, even from the southward, as the force of the waves is abated in passing over the flat, which is partly covered with seaweed; and the *Brændevin Spit.*

holding-ground is good, hard sand, with a gradually lessening depth. But if it be intended to pass to the southward of the Knæet, the course is not to be more southerly than E.S.E. ¼ E., so as to avoid the Silde Rön, between which and the Knæet the passage is only 1½ miles across, with a depth of 2 to 2½ fathoms. The narrowest part of this passage is when Byrum church is in one with the middle of the sand-down on Hornfisk, which may be seen in clear weather.

Kirke Ground. 283. The Kirke Ground is a long sand stretching north from the above-mentioned shoal of Brændevin. It is partly dry at low water, and has only 6 inches to 2 feet water. At its *South Rönner.* southern end is the South Rönner, consisting of three small rocks and a single large one, called the Bredesteen, or Broad-rock. They are all visible above water, with a depth of 2 feet round them, and extend about half a mile N. and S. The northernmost is nearly equidistant from Byrum and Vesterö churches, about 5 miles, and has 2 fathoms water close to on the west side; but farther out, in the same depth, there are three large rocks, on which there are only 3 or 4 feet water. Abreast of the South Rönner the depth of 2 fathoms will be found. At a third of a mile from those rocks, and in a W.N.W. direction, the large South Rönner flat extends 5 miles to its boundary of 4 fathoms. Between this flat and the Dvale Ground on the opposite shore of Jutland, runs the important channel of Læsö Rende, which is *Beacon.* 3 miles across. To assist its navigation, a beacon has been erected on the South Rönner. This beacon consists of an iron rod, on the top of which is a hollow double cone (◊) 3 feet long, 20 feet above the water, and painted white.

The depths on the South Rönner flat are very variable; along the outer edge there is a shelf with 14 feet only in some places, but 15 feet and more may be found, until within a mile or a mile and a half of the Rön; so that this flat may be crossed by small vessels in moderate weather. On its outermost part there are from 19 to 22 feet, except on a couple of spots, where the depth is from 12 to 17 feet; and the shoalest spot with 12 feet is on the north end of a sand-ridge, half a cable's length wide and half a mile long, in a S.W. by S. direction. This spot bears S.W. by W. ½ W. from Vesterö church, and W. ½ S. from Byrum church. The bottom is hard sand everywhere, but in some places covered with seaweed, which gives a dark tint to the water.

284. Between this flat and the North-west Reef there is a deep bay, in which the soundings gradually diminish from 6 fathoms towards the shore; and the inner part of it, to the northward of the Kirke Ground Als Deep Bay, forms a little harbour for small craft, with 5, sometimes 6 feet at its entrance, and farther in from 7 to 8 feet. It is formed by the Kirke Ground and the shallow which extends 1½ miles from the island, and which has only 6 inches to a foot water. The inlet is two-thirds of a cable's length across, and during the summer season is marked by a pole with a broom. The holding-ground is excellent, and vessels too deep in the water to run farther in come to an anchor at the distance of a cable's length inside of the pole, where they may ride out a westerly storm, though occasioning a heavy sea; but if the wind is to the southward of west, the Kirke Ground affords good shelter. *Als Deep.* *Boat Harbour.*

285. One of the most dangerous shoals off Læsö is the North-west Reef, stretching N.W. ½ N. 4 miles from Hornex Point to the depth of 4 fathoms. *North-west Reef.*

About a third of a mile from that point there is a dry shoal (Johns Knoll), abreast of which the reef is nearly 3 cables' lengths across, with only 2 feet water, and from thence to two-thirds of a mile from the extremity of the reef it consists of a narrow ridge with less than a fathom of water, but 70 fathoms across. At the outer end of the reef the depth increases suddenly from 4 to 22 fathoms in a hole that does not extend very far; and along the west side of the reef the depth suddenly changes from 2 and 3 to 6 and 7 fathoms. On that side the 4 fathoms line of soundings is generally not more than 6 or 7 cables' lengths distant from the shoal part of the reef, whereas on the north side it is much larger, with an even depth of water; and the reef ought not to be approached nearer than 3 fathoms, for even in this depth there are spots with only 1 or 2 fathoms. *Johns Knoll.*

The North-west Reef affords good shelter when a vessel, from contrary winds, currents, or stress of weather, is prevented from passing the Læsö Channel, as smooth water may be found on the lee side of the reef, and the holding-ground is excellent, especially on the north side, where the bottom is clay. But it is advisable not to come to an anchor farther inside the point of the reef than just to get shelter, for a vessel as far in as the middle of the reef, if the wind should veer round so as to make it

requisite to weigh, might find it very difficult to weather the North Rönner if she were on that side of the reef; and equally troublesome to clear the South Rönner, with its flat, in case of her being to the southward of the reef.

Beacon. Close to the end of the N.W. reef there is a floating beacon in 6 fathoms, with Vesterö church S.E. by E. 5 miles distant. It has 3 brooms on a white pole, in order to distinguish it from the beacons on the Dvale Ground, which have one and two brooms on red poles.

The bay between the North-west Reef and the North Rönner is clean, and gradually shoals towards the shore, which may be approached to within 1¼ miles, where 20 feet will be found, and even more; but farther in it shoals suddenly to 10 feet on some shallows, the largest of which is called Berre Knob.

Berre Knob.

Læsö Channel. 286. The Læsö Channel is bounded by the last-mentioned shoals, the North-west Reef, and the flat off the South Rönner to the eastward, and on its western side by the Dvale Ground.* This channel has been minutely surveyed, and beacons, both fixed and floating, have been placed on its various rocks and shoals. Its navigation, which is most important to vessels entering the Baltic, has, in addition to the lights on Hirtsholm and Forness, been further facilitated, by a Floating light recently placed on the eastern edge of the Dvale Ground.

Læsö Channel, in its narrowest part, between the eastern edge of the Dvale Ground and the South Rönner Flat, is 3 miles across, and the depth mid-channel from 8 to 10 fathoms, and decreasing towards both shores; whereas the depth increases on approaching the N.W. reef, for at the distance of a mile from thence there are 12 fathoms, and close to it 22 fathoms. The soundings are also very variable. To the northward of the reef the bottom is gradually clay, mud, and sleek; and to the southward in general sand, though here and there clay.

Læsö Floating Light. The Læsö light-vessel, which was placed in her present position in October 1852, is schooner-rigged with two masts, and painted red with a white cross. She lies in 10 fathoms E. by S. 3 cables' lengths from the middle buoy of the Dvale Ground, in lat 57° 12′ 45″ N., long 10° 41′ 45″ E. and carries a Fixed light 30 feet high, which is visible in all directions about 3 leagues.

---

* See Articles 119-122.

287. The only leading mark for Læsö Channel, in coming from the northward, is to keep Fladstrand castle tower somewhat open to the westward of Frederikshavn chapel; but these objects being so far distant, are only discernible with a glass, and in very clear weather certainly not farther than in the vicinity of the North-west Reef. But whether coming from the northward or from the southward, steer towards Sæby church until getting soundings on the Sæby Flat, according to the draught of the vessel; or keep about the distance of 4 miles outside the church; and when this church comes in one with Karup church, which is conspicuous from being on a hill, you are abreast of the North-west Reef, and may direct the course in such a manner as to pass either the Hirtsholm or the Dvale Ground. Coming from the northward, and not being further distant from Læsö than easily able to see all the houses in the village of Vesterö, together with both churches on the island, which is the case when in the fair track or mid-channel, provided it is clear weather, you are abreast of the point of the reef when both churches are in one; and you are to the southward of it when Byrum church is in one with the fifth or sixth house from Vesterö church. These marks will be useful if the light-vessel or floating beacons are gone, for, as already stated (Art. 123), vessels should not approach the Dvale Ground within 7 fathoms, as in several places at the distance of 1½ cables' lengths inside of this depth there are but 3 fathoms. With a fresh breeze and sunshine these shoals may be descried, even at the distance of 1 to 2 miles, by the tint of the water, owing to the light-gray sandy bottom. Similar, but less plainly coloured water may sometimes be observed on the North-west Reef; but the safest guide there is the lead, for, as mentioned above, the depth increases in nearing the reef, the end of which, however, ought not to be approached within 12 fathoms. By paying attention to the above-stated mark for the end of the reef (Vesterö and Byrum churches in one), you are able to know when it is passed, either going northward or to the southward. If the atmosphere over the island be hazy, but clear over the shore of Jutland, attention must be had to Karup church, which when coming from the southward is seen at the distance of 8 miles to the southward of the North-west Reef; and if coming from the northward it becomes visible when abreast of Sæby, the church of which town in one with Karup church being a good

Leading Mark for Læsö Channel.

mark for the reef. Having attained this mark you will be nearly past the reef, whereas coming from the southward it is necessary to run a mile further to the northward before it is cleared. If the weather is sufficiently clear to get a sight of Jydske Aas and Holdenberg Hills, and if you are standing towards the reef, do not bring them in one till you have passed the line of Sæby and Karup churches in one, in order to be sure of being past the reef. The view of the coast,* taken a mile to the northward of the reef, shows those two hills, which are the most conspicuous objects on that part of the coast, and their position, with regard to each other, when in a depth of 12 to 13 fathoms, and consequently within the distance of a mile. If the depth is more than that, you are within the distance of two-thirds of a mile from the reef, and you must immediately keep more to the westward.

Pilots. 288. On Læsö there are pilots, who attend when a signal is made. Those on the eastern side of the island are bound to pilot vessels to the different anchorages round the island, as likewise to Frederikshavn and Liimfiord: while those on the western side take charge of vessels going to the east coast of Jutland and the entrances of the Belts.

Vessels touching at Als Deep, or at Krogen, without taking a pilot, and not belonging to the inhabitants of the island, are bound to pay half pilotage, if the marks for the inlets to these boat harbours are in their respective places.

Tides. 289. The tides about Læsö are in general subject to the same irregularities as those of the rest of the Kattegat, the principal irregularity being occasioned by the force and direction of the wind, which entirely masters their natural strength; but the position of the island in the midst of the Kattegat, along with the forms of the banks, forces the stream through the Narrows, and thereby increases both its strength and direction.

In moderate weather, the time of high water at full and change is about 7 o'clock A.M. The velocity is 1 to 2 knots, and the common rise about 1 foot. But in boisterous weather the current may sometimes continue for three weeks to run the same way, and even to attain the velocity of 4 knots; and in a furious gale of wind, on the 15th of January, 1818, the water actually rose 5¾ feet above the common water-stand.

* View 17.

In the Channel of Læsö even the common direction of the streams is very irregular. The northern current sets N.E. from the Kobber Ground and Flynder Ground beacons; but on the Middel Ground and Syr Point beacons it takes a N.E. by N. and a N.N.E. direction towards the Swedish coast. In the vicinity of the Trindelen it runs N.N.W.; between the Trindelen and the shore N.W.; and close along the northern shore of the island its direction is W. by N. In the same manner the southern stream sets towards the S.W., from the northward and eastward of the Trindelen; whereas, between the shoal and the island it runs south-easterly. Sometimes it happens, in boisterous weather, that a current for many successive days runs east or west, alike on the east and the west side of the island, probably on account of the meeting of the southern and northern streams.

290. During severe winters the ice forms on the shallows off Læsö, especially along its S.W., S. and S.E. shores; but to the northward, and especially in the direction of the Trindelen, open water is to be seen in several places, so that it is the prevailing opinion that ice seldom remains for a long time on that shore. On the Kobber Ground it remains for the longest time: but still this period has never been known to exceed seven weeks. The ice forms the quickest with north-east and east winds, and generally at the time of low water; yet this seldom takes place before the months of December and January, and it is soon broken and dispersed by southerly and south-easterly winds, which are usually accompanied by a current from the southward. Between Læsö and Jutland the ice is never known to have been stationary all across, owing to the currents constantly keeping open water in the mid-channel. It may, however, happen that the whole of the channel, in settled weather and with a northerly current, may be choked by ice from the southward, and then it may remain for some time blocked up in the Narrows. *Ice.*

On the shoals of the Kobber Ground, Silde Rön, South Rönner, the North-west Reef, and the Bourfeld, the ice is sometimes piled up to a considerable height; but this never takes place on the Trindelen. The ice seldom forms on these shoals before late in December, and rarely remains longer than the first weeks of March, so that by the end of the month even the largest piles of ice have commonly disappeared.

Though drift ice often appears in large and endless masses,

yet it is less dangerous to shipping, from having been broken on its passage from the southward before it reaches the latitude of Læsö, by which time it has lost part of its sharp-cutting edges.

The great bank of Læsö and Anholt.

291. The islands of Læsö and Anholt do in a manner form the extremities of a large bank, carrying from 4 to 9 fathoms, and extending from the coast of Jutland eastward to the deep-water channel in the eastern part of the Kattegat. Owing to this inconsiderable depth, the sea does not rise very high on this flat, which serves not only to shelter the different anchorages along the Jutland shore, but is in itself to be considered as one great anchoring-ground, fit for any vessel in moderate weather, and for large ones under all circumstances.

The Sanden.

292. The eastern face of this flat is called the Sanden; it is generally composed of light sand, partially overrun with seaweed, particularly to the southward in the vicinity of Anholt; and along its outer edge the depth suddenly becomes very great, falling, in some holes, to 65 fathoms. Inside the depth of 10 fathoms, between the southern extremity of the Kobber Ground and the reefs of Anholt, the bottom generally consists of fine sand, with black specks; but outside of that depth the sand is dark and reddish and mixed in some places with pebbles. This is the case on the patches detached from the south end of the Kobber Ground. This outer edge of the Sanden not only differs from the deep to the eastward by its shoal water, but also by the nature of the bottom, which in the deep is sleek and mud. These sudden changes, from the deep sea to the flat and from mud to sand, are of great use to the navigator; and the line of partition is exactly laid down in the chart, although some of the deep holes have not yet been inserted.

293. Off the tail of the Kobber Ground it is said that there is a knoll with only 12 feet water, and it appears in some of the old charts, together with a notice of the authority by which it was laid down; but the most diligent search has been unable to detect it. A brig in 1832, a sloop in 1839, and two other vessels in 1841, are supposed to have struck on this shoal; but it may be doubted whether they were not on the extremity of the Kobber Ground itself. As long, however, as there is any uncertainty on this subject, ships of the line should not cross that part of the flat till a more minute survey has been made; the more so, as nothing prevents even such large ships from shaping a

direct course through Læsö Channel, or crossing to the northward of Anholt, there being no occasion to stand too near the shoals to the southward of Læsö. So long as the lighthouse of Anholt is kept in view from the deck, or while a vessel is within 16 miles to the northward thereof, she will be to the southward of the southernmost 20-feet knoll of the Kobber Ground, and in this large open space she may traverse the flat in every direction without the least obstruction.

294. Just in the fair track through the Kattegat, between the Kobber Ground and an insulated shallow named the Fladen, there is a bank called the Grove Flat, extending about 8 miles N. and S., and from 3 to 5 miles E. and W., with a depth varying from 11 to 20 fathoms, and soundings of sand and red pebbles, or shells and sand with red specks. All round this bank there is deeper water, and commonly soft bottom, except at its southern extremity, where the bottom consists of stones and rock. It may be considered as being part of the great bank of sand, being only separated from it by a deep-water channel, scarcely 2 miles across; and this channel may be of use in sounding, as vessels beating about may be warned thereby of their approach to the Kobber Ground, or its adjacent shoals. *Grove Flat.*

295. Farther to the southward there is yet another bank, the Middel Flat, between the Lille Middel Ground and the Sanden, and separated from the latter by a narrow and crooked channel, with a depth from 20 to 40 fathoms. This flat has, in an extension of 2 miles in every direction, a depth varying from 10 to 18 fathoms, the bottom gravel and red sand mixed with pebbles, particularly on the east side, where the depth increases very suddenly to 40 fathoms with sleek, which sort of bottom continues, but with less depth of water, up to the north-west side of the Lille Middel Ground. *Middel Flat.*

296. Anholt, the second island in the Kattegat, is, like Læsö, surrounded by dangerous and extensive shoals, of which the most remarkable is the East Reef, its extremity projecting immediately into the deep water of the eastern part of the Kattegat. To give warning of this reef, a light (ever since 1582) has been placed near the east point of the island. It is now on a tower, elevated 122 English feet above the level of the sea, and standing 1½ miles W.N.W. of the point. It revolves every 25 seconds, being bright for 6 seconds and dark during the remaining 19 *Anholt Island.* *Revolving Light.*

seconds. In the same building, 57 feet above the sea and on the side facing the reef, there is a single lamp, which is shown whenever the light-vessel off the point of the reef is absent, but is not lighted while that vessel is in her station.

East Reef. 297. The East Reef extends E. ½ S. somewhat more than 5½ miles from the lighthouse, and consists of two parallel shelves, between which the depth is somewhat greater, but few vessels that ground on either of them ever succeed in getting off. The shoalest *Kobber Spit.* part of the reef is the Kobber Spit, which consists of pebbles, with only 2 or 3 feet, and lies halfway between the lighthouse and the extreme point of the reef. That point still preserves its old *Knob.* name, the Knob, which it took from the circumstance of a small holm or cay, covered with grass, having been there till about 50 years ago, but which has been entirely swept away by the current, leaving now 2 fathoms water.

Inside the Kobber Spit small craft may stand across the reef in 7 feet when the water is smooth, but a good look-out must be kept to avoid wrecks, which frequently encumber this passage. Outside the Kobber Spit the depth on the reef is commonly about 10 or 11 feet, but it is changeable and generally least on the northern shelf. This part of the reef may therefore, in settled weather and smooth water, be crossed by small vessels.

The depth on both sides of the reef suddenly increases to 10 or 12 fathoms, and off the end of the reef is steep-to from that depth.

Beacon. 298. To mark the point of the Reef, a floating beacon (the broom on which may be discerned 4 miles in clear weather, by using a glass) is placed there in 10 fathoms; and E. ½ S. from the point, *Anholt Light Vessel.* at the distance of a short mile, there is a schooner-rigged vessel which shows a light on her main-mast, 26 feet high, as well as a red ball 4 feet in diameter on the fore-mast, 54 feet high. In foggy or thick weather a bell is tolled for five minutes, and at intervals likewise of five minutes. Her sides are painted red with a white cross, and she takes her station on the 1st of March, if the ice permits, remaining until the 21st of December.

During the absence of the light-vessel the reef may be approached in the day-time, as the colour of the water plainly shows the reef, an effect produced by the light-coloured sand which collects there; and at night, by attending to the single lamp in the middle of the lighthouse. With westerly winds the reef may be taken close, but this ought only to be attempted with a

steady breeze, for the current is uncommonly violent round the point.

299. Along the south-east side of Anholt, in Pakhuus Bay (so named from Pakhuset, a storehouse), the shore is perfectly clean, with deep water at the distance of 2 or 3 cables' lengths from the beach. But from the south point, and along the west side up to the north-west point of the island, it is surrounded by extensive flats and shoals, which may, however, abreast of the south point of the island, be approached by the lead, though with circumspection. The depth suddenly changes there from 4 to 2 fathoms, and farther in on the flat it is irregular; but all the bottom is sand, except on the rocky shoal called Steensöre, where in several places there are but 6 or 7 feet water. It lies abreast of South Bierg, about three-quarters of a mile from the south-west point of the island, and is 7 cables in length by 1 in breadth. Between the shoal and the island there is a common passage for small craft bound to Anholt. *Pakhuus Bay.* *Steensöre.*

The 4-fathoms line lies about 4 miles to the westward of the island, and to the north-west 7 miles.

300. Fully a mile off the north-west point of Anholt there is a shoal that dries at low water, and from thence the North-west Reef extends nearly 2¼ miles N.W. ½ W. It is a narrow ridge of rock, with a variable depth from 5 to 10 feet. The sea breaks on it with the least motion of the water; but on either side, and close to it, there are from 13 to 15 feet, with a sandy bottom. Between the dry shoal and the small reefs which fringe the north-west point of the island there is a very useful passage, with 15 feet water, and more than ¾ cables' lengths wide, the deepest water being close to the shoal, and the direction of the passage W. by N. Being obliged to stand through this passage during the night, the light must be brought to bear E.S.E. ½ E. *North-west Reef.*

Along the northern shore the bank gradually shoals up to 3 fathoms, and inside of that depth there are uneven shelves which change with every storm. The extent of the flat lessens from the North-west Reef towards the eastern point of the island; thus, abreast of the North Bierg the 4-fathoms line is 2 miles off shore, whereas abreast of the lighthouse it is only a mile.

301. With southerly, northerly, and easterly winds, vessels may anchor under the lee of the island, if on the north side in 5 or 6 fathoms, if on the south side in 8 or 10 fathoms, and on the *Anchorage.*

west side in 4 fathoms; this last position, however, is so far from the shore that it will scarcely afford any shelter. With westerly winds there is no shelter for large vessels under the lee of this island, but small craft may anchor in Pakhuus Bay, on its south side, and lie sheltered from the N.E., and round by N., to W.S.W. With the wind from W.S.W. and round from thence to S.E., they will find better shelter on the northern side of the island, with North Bierg bearing S.S.W. With the wind between S.S.E. and N.E., there is good anchorage in 2 fathoms to the westward of the island, abreast of the high land; and if from N.E. to N. the best anchorage is in 1½ to 2 fathoms, off Gyden, a low point to the southward of South Bierg.

In all these anchorages vessels must be ready to weigh immediately, if the wind should happen to veer round so as to blow along the shore. This may prove difficult enough from Pakhuus Bay, for a vessel from thence will have a long beat to windward, and generally against the current, in order to weather the west end of the island, and, still worse, to get round the East Reef, which can be done only by fast-sailing vessels. The difficulties in getting away from the north side are less, inasmuch that the distance they have to beat is shorter.

Kleins Reef. 302. A bank named Kleins Reef is laid down in the old charts to the southward of Anholt, but though sought for, it has not been found, and therefore its existence is extremely doubtful.

Lyse Ground. 303. Between 4 and 7 miles to the north-eastward of Hesselö Island there is a very dangerous shoal called the Lyse Ground: its length N.E. and S.W is about 3 miles, and its breadth varies from 1 to 2 miles. It is just in the fair track of vessels coming from the northern harbours of Jutland and going to the Sound, or from the Swedish harbours and bound to the Belts; and being in the deep-water of the Kattegat, it becomes doubly dangerous to ships obliged to beat to windward there. The above-stated extent of the shoal is that of the flat, on which the common depth is 3 fathoms; but in several places there are not more than 1 or 2 fathoms, and on the northern part there are patches with only 2 or 3 feet. The shoalest spot is at the north-east angle, outside of which there is a floating beacon in 7¼ fathoms, carrying two brooms; and from this beacon Hesselö Light bears S.W. ¼ S. and Kullen Light E.S.E. ¼ E. Another beacon, with one broom, is placed in 4½ fathoms off the south-west point of the shoal; and

from this Hesselö light bears S.W. by S., and Kullen light, E. by S., rather southerly. The danger of this shoal has further been diminished by the erection of a Revolving Light on Hesselö, by which, and by the lead, the shoal may be avoided in clear weather; but it ought not to be approached nearer than in 5 to 6 fathoms. Everywhere when the depth is more than 2 fathoms on this flat, the bottom is sand, with spots of sea-weed, whereas it is rocky when the depth is less, and the shoalest part consists of pebbles mixed with large stones. The colour of the water on this shoal is not lighter than commonly is the case where the bottom is light-coloured sand.

The space between Anholt and the Lyse Ground is perfectly clear, with 16 to 10 fathoms water on a sandy bottom, and somewhat shoaling towards the Lyse Ground; and so is likewise the channel between that shoal and Hesselö, being 3¼ miles across with 10 or 12 fathoms water, and clay bottom.

304. The third and smallest island of the Kattegat is Hesselö, off the S.E. and N.W. points of which are two inconsiderable reefs, the first in the direction of S.E. ½ S. to the distance of three-quarters of a mile, and the other N.W. by N. 1¼ miles. At the end of the former there is a dry rock, which is steep-to, but with 4 fathoms water close to it; and between it and another dry spot, close to the shore, the reef consists of a rocky ridge with from 2 to 10 feet water; the sea breaks over it with the least motion, and boats may cross the reef only when it is perfectly smooth. This reef, as well as the North-west Reef, may be approached by sounding, but do not stand nearer in than in 7 to 6 fathoms, particularly in the dark. *Hesselö.*

Nearly a mile of the North-west Reef is dry, with 2 or 3 fathoms close along its S.W. side, but all foul, with large rocks, and therefore impassable even for boats.

With the wind off the island, vessels may find good anchorage on either side of the island, but not closer than in 4 fathoms, even if provided with chains, and in less than 7 fathoms with cables of hemp.

305. The situation of this island in the track of vessels going in every direction, and its proximity to the dangerous Lyse Ground, made it expedient to place a powerful light there, and accordingly it now possesses one which revolves once in a minute, 19 seconds of which it gives a good bright light; during the next *Revolving Light.*

11 seconds a still brighter glare; then for 19 seconds a light of the former strength; and for the remaining 11 seconds it is altogether eclipsed. As it stands 87 feet above the level of the sea, it may be seen 14 miles; and the tower which is 33 feet high and whitewashed, serves as a beacon during the day-time.

Hesselö Boat Harbour. 306. In the bay to the eastward of the North-west Reef there is a small harbour which admits large boats, but it is open to N.E. winds. A shoal with 3 to 4 fathoms, white sand studded with sea-weed, is said to lie 4 to 5 miles off Hesselö, with the light bearing S.S.E. ½ E., but it is not shown in the survey of 1847.

East Channel of Kattegat. 307. In the eastern deep-water channel of the Kattegat, and nearly in the line north and south, there are three separate shallows or banks, viz.: the Fladen, the Lille Middel Ground, and the Store Middel Ground, of which the first two named are dangerous to large ships, whereas the third is a bank with sufficient water, and all of them are of great use to the navigator in marking his position.

Fladen Bank. The northernmost and smallest is the Fladen, a sand-bank with from 10 to 12 fathoms water, lying in the mid-channel, with a common depth round it of 30 fathoms, mud. The bottom on the bank is very remarkable, being thickly overspread with small red and flat stones, not unlike bits of brick.

According to the reports published by British cruisers during the last war, the dangers of this bank consist of a couple of rocks a mile apart, on its south-east side, on one of which there are 21 feet water, with 12 fathoms all round. The bearings from this spot are, Warberg Castle S.E. by E. ½ E., and the Nidingen lights N.E. by E. On the other rock, which bears N.E. by E. a mile from the former, there are 23 feet water, with a surrounding depth of 7 fathoms. According to the late Swedish surveys, there is another and yet shoaler spot 2 miles N.E. of the above-mentioned rocks, and the depth is said to be only 18 feet water; but though marked in the chart, it needs further verification.

Lille Middel Ground. 308. The Lille Middel Ground is a very extensive bank, its length being 13 miles N. and S., and from 3 to 6 miles across. The southern extremity lies about 7 miles east of Anholt lighthouse; the soundings are sand and shells, with a depth of 30 fathoms gradually shoaling to 15; and to the eastward of the bank, mud and sleek are found in 23 to 26 fathoms.

Consequently, in coming from the southward, and Anholt light bearing to the southward of west, the soundings will tell whether a vessel is on this Middel Ground or to the eastward of it, so that she may take such a course as will clear the northern and shoal part of the bank. The shoal part consists of rocks, on which there are only 18 or 19 feet water, but they do not extend more than a quarter of a cable's length where the depth soon increases to 4 fathoms and more. The shoal was for many years laid down in the chart too far to the eastward, but its true position is in 56° 57′ 6″ north, and 0° 40′ 51″ west of Copenhagen; or 11° 53′ 56″ east of Greenwich. It is reported that the sea breaks on the shoal in stormy weather, and under such circumstances it must be very dangerous to small craft; but no vessels, large or small, ought to approach it so near as 8 fathoms, as inside of that the soundings are irregular, and in this last-mentioned depth will be found very close to the shoal, both north and south of it; whereas towards the E.N.E. a flat extends to the distance of a mile, and two-thirds of a mile wide, on which the depth is alternately from 4 to 7 fathoms, whitish chalky bottom. A very minute survey has been made of this shallow part of the bank, which is very dangerous to shipping by its position; but navigators may be better able to judge of their true place on the bank by attending to the following statement of the change of the soundings, when approaching it on any one of the eight principal points of the compass, as far in as to the depth of 8 fathoms, within which it would be imprudent for large ships to venture:—

From the N. the soundings are fine loose sand—hard sand—coarse shingle.

From the N.E. fine loose sand—chalk stones—large stones—red sand—and shingle.

From the E. grey sand—shingle and shells—yellow sand—chalk stones.

From the S.E. coarse sand with cockle shells—shells and stones—stones—red sand.

From the S. fine sand—sand and shell—stones—coarse sand with cockle shells—coarse gravel—coarse yellowish sand.

From S.W. fine sand—sand and shells—coarse sand with cockle shells—coarse gravel with stones—stones.

From the W. coarse sand—shingles and large stones—brown sand spotted with black—coarse sand and shingles.

From the N.W. fine sand with stones—coarse sand—brown sand—fine sand with stones.

309. Another bank, but much smaller, lies a mile to the eastward of the Lille Middel Ground, being separated by a deep-water channel with more than 20 fathoms, on fine sand generally. Coming from the northward, both of these banks have an equal depth on the edges, and it is only by paying attention to the nature of the bottom, and to the depths in proceeding to the bank, that the one may be distinguished from the other, as the depths on the Small Bank do not correspond with those of the Middel Ground, as mentioned above. On the contrary, coming from the southward the difference is very remarkable, the Lille Middel Ground on that side shoals gradually, whereas the Small Bank is so steep, that from the depth of 20 fathoms, and soundings of fine sand, which are to be found on its edge, it rises suddenly to 10 or 11 fathoms, with chalk stones mixed with shingle; and after being past this remarkable step on the bank, the water again deepens to 15 or 16 fathoms, with soundings of broken shells and cockle-shells.

To the eastward of that Small Bank there is yet a third bank, or rather a flat, on which the depth generally is 16 to 18 fathoms, with soundings of stones and shells; but this bank is of little consequence to navigation, and very small in dimensions.

Store Middel Ground.

310. Store Middel Ground is a bank directly in the fair track of the Kattegat, and the soundings help the navigator, without being dangerous. On the edges of the bank the soundings are not remarkable, and the quality is marked in the chart; but in the middle of the bank there is a shallow part with only 5 fathoms, which will be found a very useful guide, because the water shoalens on approaching the flat, from all sides, with stones, shells, and small black particles like ground pepper.

Röde (red) Bank.

To the northward of this bank there is another much smaller bank, and with a uniform depth of 15 to 17 fathoms, called the Röde, or red bank, owing to its bottom consisting of coarse reddish sand.

CHAPTER V.

THE SOUND.

311. To all seafaring men it is well known that Ore Sund is the Danish name of the strait that separates Denmark, or rather the island of Siælland, from Sweden; but this appellation seems to refer to its narrower part, whereas the whole arm of the sea that unites the Baltic and the Kattegat is by the English called the Sound. In cases of insurance it is essential to have fixed denominations, and it is therefore officially stated in the Danske Lods, that the Öre Sund extends from a line passing through Wiken and Nakke Head to the island of Hveen. *Öre Sund.* *Limits.*

312. In entering the Sound from the northward, vessels are advised to be careful, in hazy weather, not to mistake the Häfs Kulle for the Kullen; but when the latter is satisfactorily made out, its revolving light, and then the two fixed lights on Nakke Head, will be sufficient guides into the Sound from the offing, where there is a depth of 13 fathoms, on a sandy bottom, and farther in on clay. This depth increases a little when close in to the Kullen; and, on the contrary, decreases on approaching the shoals off Gilleleie; while in the narrows of the Öre Sund the depth is irregular, varying from 16 to 20 fathoms.

313. In the Sound* there are but two harbours formed by nature, viz., Copenhagen and Landskrona, both of which are excellent, but the whole of the Sound to the southward of Kronborg castle may be considered as one great anchorage, particularly its northern part off Elsinore (Helsingör). As vessels are bound to pay the Öre Sund duties at the custom-house of Elsinore, this anchorage is of very great importance to the numerous vessels that are *Duties.*

* See Chart, Entrance to the Baltic.—Sheet II. The Sound.]

obliged to come-to there for that purpose, and we shall therefore give minute directions for attaining this roadstead under all circumstances.

Pilots. 314. Those who are unacquainted with the localities ought to take a pilot, for by a competent knowledge of the currents he will frequently manage to get in, while other vessels are obliged to remain outside. The best and most skilful pilots are those from Gilleleie, Hornbek, and Elsinore on the Danish shore. The pilots from the first two named places only take vessels to Elsinore; whereas those who belong to Elsinore, and who may be generally found a short distance to the northward of that town, may take them through the Sound into the Baltic. On the Swedish coast *branch* pilots are to be had at Höganæs and Helsingborg, while at all other places on that coast fishermen only can be obtained, and their skill as pilots is not warranted.

Currents. 315. The vast quantity of water which from different parts of the European highlands finds its way into the Baltic, and is from thence poured into the Kattegat through the Sound, produces an almost constant current there to the northward. During settled weather the velocity of this continual stream is from 1 to 1½ knots; and any change in its rate depends on the force and direction of the prevailing winds. Thus, winds from N.E. round by E. and S. to S.W. increase in rapidity—winds from N.E., and N., as well as those between S.W. and W., have generally but little influence—and when it blows from between W. and N. the ordinary motion of the water is not only repelled, but even a southerly current produced. Nor is it necessary to this result that the last-named winds should blow home, it is enough that a gale should have swept across the North Sea in that direction for several successive days. In such a case the current from the northward is first perceived along the Swedish shore, where the usual current to the northward is in general weaker than on the Danish side; but even then it reaches only to Kronborg Point, where, meeting with the opposite and usual current, it produces a rippling, or a kind of whirl in the water, which is not however dangerous, even to boats. The natural tendency of the Baltic to pour its water out to the northward, makes it probable that the current, at some feet deep, is constantly running in that direction, even when a southerly current is running with considerable strength on the surface.

316. Of course the influence of the moon and of the sun do more or less affect the movements of the water here as elsewhere; but it is only when the weather is completely settled that a change of a few inches in the waterstand announces the rare phenomenon of a flood and ebb tide, and they are never so strong as to interfere with the direction of the current. When it happens that the current runs to the northward along the Danish shore, and to the southward along the Swedish side, the line of partition is plainly marked by a rippling on the water from the north side of Hveen island along the mid-channel. Even with the common current from the southward slight ripplings are often produced between it and the weaker current, or slack-water, near the Swedish shore; and in the same way a slight rippling may be seen close round Kronborg Point along the edge of the Lappe Ground. *Lunar Tides.* *Ripplings.*

317. At a short distance from Kronborg Point the current runs the strongest, sometimes at the rate of 4 or 5 knots; owing to which that point is steep-to. Very close in to the point there is an eddy by which row-boats are able to pass it, and even sailing-boats when working to windward, provided they sail well, are sure of not missing stays, and are handled with the usual skilfulness of the Elsinore ferrymen; otherwise it is dangerous to attempt this manœuvre, for if the boat touches the ground, she is inevitably lost. A similar eddy is likewise frequently to be found on other parts of the coast, especially when the current from the northward runs on the surface of the water while a contrary current is acting below. *Kronborg Eddy.*

The current from the southward sets from Kronborg Point, where it is strongest, right over to the Swedish shore in the direction of a little to the northward of Pålsköp, and from thence it spreads over the whole extent of the Sound, sweeping close round the point of Ellekilde on the Danish shore, but likewise running with considerable velocity across the shoals of Kulla Gunnarstorp and Svineboen. Inside the Lappe Ground, as likewise in Hornbek Bay, the current is always much weaker. *Current in the Narrows.*

The current from the northward follows the course of the channel as far as Kronborg Point, and then it sets strongly towards Knähaken Point, 2 miles to the southward of Helsingborg.

The fishermen on the coasts generally name the current from the southward, owing to its constancy, *the Current;* and that

from the northward *the Tide*, because it is commonly accompanied with higher water.

Northern Entrance. 318. Vessels may enter the Sound from the northward, even with an adverse current and wind, by hugging the shores, principally the Swedish shore, and thus avoiding the violence of the current; but to effect this it is necessary to have a pilot, or to be perfectly acquainted with the projecting shoals, for which we now are going to give directions.

These directions will be divided under the following somewhat arbitrary heads:—

1. The space from the promontory of Kullen to Kronborg, with Elsinore Roads, and the principal passages into the Baltic and to Copenhagen.

2. The Flint Channel, with directions for entering the Sound from the southward.

3. The eastern shores of the islands of Siælland and Möen, as far as the Grön Sound.

THE ÖRE SUND FROM THE KULLEN TO KRONBORG.

Swedish Shore. 319. The coast of Sweden to the southward of the Kullen is low, and lowest at Wiken, which stands on a sandy point, but from thence it again rises to a moderate height as far as Helsingborg. The shore is steep with a whitish tint, and is muddy round the mansion of Kulla Gunnarstorp. Among the most remarkable objects are, Höganæs, with the steam chimneys belonging to the coal-mines of Ryd; Wäsby church, with its spire; Wiken church which is whitewashed, with a red roof; Kulla Gunnarstorp, an old mansion, having a large windmill in its vicinity; and finally the square tower of Kærnan, just above the town of Helsingborg.

Mölleleie. 320. Close to the southward of the hills of Kullen there are some fishermen's houses called Mölleleie, with a boat-harbour carrying 4 feet water; and abreast of this a reef, inside of which vessels *Lerhamn.* drawing 8 feet may find some shelter. At Lerhamn there is a stone pier of short extent, along which boats may land. At *Nyhamn.* Nyhamn there is a very good boat-harbour, having from 4 to 5 feet water, being formed by a reef which extends to the southward.

Gaddebo Reef. 321. Abreast of these places, at the distance of a third of a mile from the beach, and nearly in the meridian of the highest part of

the Kullen lies the reef of Gaddebo, consisting of large rocks with only 3 feet water, and steep from 5 to 1 fathoms.

S.S.W., 1¼ miles from the shoal, lie the Skars Rocks, with 5 feet water on their shoalest part, and steep-to in 5 fathoms; the outside of this reef is marked by a floating beacon. *Skars.*

S. by E. ¼ E., a third of a mile from them, comes the Nord Skars, between Nyhamn and Höganæs, and nearly half a mile from the beach; they form a narrow ridge of rock a third of a mile long, and lying north and south, with only 6 feet water on its shoalest part. Inside of this reef the depth is 3 fathoms, and on the outside it suddenly increases to 6 fathoms. *Nord Skars.*

The mansion of Krapperup in one with the middle of the houses at Lerhamn leads close to the westward of Gaddebo shoal in 6 fathoms. Krapperup open to the southward of Lerhamn, and the steeple of Wäsby church open to the northward of the large wood to the northward of Höganæs, leads a third of a mile outside the Skars Rocks in 7¼ fathoms water. With the same steeple in one with the northern part of the wood, and Krapperup open to the southward of Lerhamn, you are abreast of and clear of the Nord Skars.

322. With Lerhamn in one with a saddle to the eastward of the highest part of the Kullen hills, you just pass to the westward of the Steenbotten, a ledge of rocks with only 5 feet water, but inside of which there are 6 fathoms. It likewise clears the shoals of Mölleground and the Askeground. The Mölleground bears W.N.W. from Höganæs beacon, distant a mile from the shore, of small extent, and has on the shoalest part 15 feet water over large rocks; and on its outside there is a floating beacon. To the north and west of this shoal the depth suddenly increases to 4¼ fathoms; but S.E. ¼ S., a quarter of a mile from it, the Askeground has only 9 feet water, and ends in a tongue with 22 feet, which extends half a mile N.W. ¼ W., and between which and the south side of the Mölleground there is a narrow 5-fathoms channel. *Steenbotten Rocks.* *Mölleground and Askeground.*

323. The south side of the inlet to Höganæs is formed by a shoal called the Hamneboe, the west end of which, with 16 feet water, bears W. ¼ S., 1 mile from Höganæs beacon. On the north side this shoal is steep-to in 5 fathoms, whereas a flat with 18 to 22 feet water extends about a third of a mile to the westward. To pass to the northward of this flat, bring Wäsby church spire in one *Hamneboe Shoal.*

with Höganæs beacon; and to pass well to the westward of it, in 9 to 10 fathoms, the Kærnan tower, at Helsingborg, is to be brought in one with the point at Wiken, or the eastern high part of the Kullen over the middle of the Lerhamn.

Höganæs Road.

324. Between these last-named shoals is the inlet to Höganæs Road, a place of some consequence, owing to its coal-mines and manufactories. It has a long wooden pier, where vessels not drawing more than 6 or 7 feet may take in cargoes; but this pier is frequently destroyed by the sea in north-west gales, and the stone pier, farther to the southward, is only half the length of the former, and has but 3 feet water. In the road, S.W. from the pier, the depth is 2 to 3 fathoms, with good holding-ground of fine sand and clay. Vessels may load here drawing 12 or 13 feet, but the road is entirely exposed to the N.W.

Pilots.

Beacon.

Regular branch pilots are found here, and ought to be called for before entering this narrow inlet. A beacon, the top of which is 70 feet above the level of the sea, has been erected on the beach. It is a pole, with many supporters, painted red, and carrying a barrel on end, and under the barrel a white board, which may be seen 2 miles off. This beacon kept midway between Wäsby church steeple and Höganæs mill is the leading mark for the inlet, in which there are 4½ to 5 fathoms, and when inside the shoals, the beacon is to be brought in one with the church steeple, to run for the anchorage. If the beacon be not seen, and yet obliged to beat in, do not bring Wäsby church spire to the northward of the custom-house, nor more southerly than a quarter of a point to the northward of the mill.*

Jungnæs Rocks.

325. Jungnæs Rocks consist of two shallows; the northernmost and largest has a depth of 8 or 9 feet, but in the middle of the southernmost there is a spot with 5 feet only, bearing W. by N. three-quarters of a mile from the fishermen's houses at Lerberg. Between these shallows there is a channel with 3 fathoms water, but only one cable's length across. Outside of this shoal there is a floating beacon. In the same direction lies the Flesk Reef, the extremity of which is separated from the south side of the Jungnæs Rocks by a narrow channel 14 feet deep. The Flesk Reef affords some shelter to the Lerberg boats, as they take refuge on either of its sides; but the best boat-anchorage is on the south side of the inner reef, where the depth is 4 feet.

Lerberg.

To the westward of the Jungnæs the depth suddenly increases to 9 and 10 fathoms, coarse sand. Wäsby steeple, between the village of Höganæs and the mill, to the southward of the same, together with Kærnan tower in one with Wiken Point, just clears the northern shoals; and as the steeple is brought nearer to the mill, the Kærnan should open outside the point till Wäsby steeple is in one with the mill, when the Kulla Gunnarstorp mill ought to be in one with Wiken Point.

326. Svineboen and Steenskars lie north and south from each other, and 2 cables' lengths apart, having on the shoalest parts 2 and 4 feet water. The Svineboen bears N.W. by N. distant seven-eighths of a mile from Wiken church; and outside of it a floating beacon has been placed. By entering to the southward of these two rocks, vessels may find an anchorage sheltered from westerly winds between the shoals and the shore in 3 to 3½ fathoms water. To the westward of these shoals the depth increases suddenly from 6 to 8 fathoms, coarse dark sand and rocks. The Steenskars are passed to the southward in 3 fathoms by keeping Wiken mill just open to the southward of the church; and Kulla Gunnarstorp mill in one with Gnetaröd leads to the westward of the shoal in 7 to 9 fathoms water. Wiken is a very large village of fishermen's houses, with a harbour for large boats and a wooden pier, alongside of which, however, only small boats may come. *Svineboen.* *Stopping places.* *Steenskars.*

327. South, distant 1 mile from Wiken church, and a third of a mile from the beach, lies the Trinnegrund, a rocky shoal with 7 feet on its west end, off which the depth soon increases to 9 and 10 fathoms. *Trinnegrund.*

Off another cluster of fishermen's houses the hooked-shaped reef of Domsten forms a little harbour, in which small craft may lie tolerably sheltered. *Domsten Reef.*

328. The Grolle Ground bears south from Wiken church 2¼ miles, and W.N.W. from Kulla Gunnarstorp, distant 1½ miles; it extends N.E. and S.W. for 480 yards, but is very narrow, with a depth of 15 feet, and surrounded by a flat, which is two-thirds of a mile long N. and S. Inside the shoal there are 4 or 5 fathoms, and outside the depth soon increases to 14 and 15 fathoms, rocky bottom. Off this dangerous shoal there is a floating beacon. When Nordskov mill (on Siælland) is open its own breadth to the northward of Odinshöi (Odin Hill), and until the *Grolle Ground.*

mill comes in one with the wood you are abreast of the shoalest part of the Grolle Ground. The Nakke Head lights in one lead on the south end of the shoal; and the highest part of the Kullen in one with Wiken church clears it to the westward in 6 to 13 fathoms water.

Gnetare Ground. 329. The Gnetare Ground consists of two flats or shallows, with 15 to 16 feet to the eastward of the Grolle Ground, and 4½ cables lengths from the beach. *Marks.* Nordskov mill in one with the middle of Odinshöi leads on the southernmost shallow; but the westernmost high part of the Kullen in one with Wiken church leads outside the shoal in 9 fathoms.

Kulla Gunnarstorp Rock. 330. The Kulla Gunnarstorp rock is the southernmost of the isolated shoals along the coast, and lies W. by S. distant two-thirds of a mile from Kulla Gunnarstorp. It is a very small patch, but it carries only 4 feet water; and S. by E. from it there is another patch with 10 feet water, which extends to a distance of 2 cables' lengths, where the depth increases very suddenly. Either, Nordskov mill, its own breadth open to the southward of Odinshöi on Siælland, or a low grove in one with a field between two groves in a somewhat more elevated position, between the mansion of Kulla Gunnarstorp and the mill, lead exactly on the shoalest part. With this cross-mark, but keeping at the same time the western highland of the Kullen in one with Wiken mill, this patch of rock is passed on the outside in 9 fathoms, stones and gravel. From this place to the southward the shallow along the beach does not extend out more than 3 cables' lengths, and *Hittarp Reef.* the only dangers to be avoided are—1st, the reef, abreast of the fishermen's houses at Hittarp, which is steep-to in the deep-water channel; and 2ndly, a very short reef, abreast of the Beghouse close to the northward of Helsingborg.

Helsingborg Harbour. 331. Helsingborg harbour is formed by piers of very solid masonry; the entrance is at the south-western angle, between two turrets, one on each pier-head; and in the northern turret *Light.* there is a Fixed Light 27 feet above high water, and visible 7 miles off. The depth inside is intended to be 12 feet, but as yet it is only 8 feet in the mouth, and constant dredging is necessary even to maintain this depth, because the gales from the N.W. carry in sand, and the current from the southward seaweed, all which tend to block the harbour, in spite of every effort to prevent these annoyances. To help vessels in getting out, a buoy

has been placed 2 cables' lengths S.W. of the harbour. There is no place in Helsingborg where vessels may be hove down or repaired; nor can resources of any kind be obtained for damaged vessels. The water, however, is excellent.

When it is impossible to enter the harbour, a red flag is hoisted on the southern pier-head.

A regular ferry, but in open boats, crosses the Sound between this place and Elsinore.

Danish Shore.

332. In entering the Sound from the northward, the light green slopes and beech woods of the Danish shore strongly contrast with the high and dark appearance of the Swedish hills; and Blidstrup, Græsted, and Gilleleie churches, with the tall steeple of Hornbek, together with the two white lighthouses on Nakke Head, are all pleasing and conspicuous objects. From Nakke Head the elevation of the shore diminishes towards Dronninge Mill, and is very low all round Hornbek Bay, as far as Ellekilde Point, where it rises into the woody hills of Ornehöi and Odinshöi, and again drops at the little palace of Marienlyst, into the low point of Kronborg. The most remarkable objects are, the Ölhöi, 2½ miles to the westward of Gilbierg Head; Blidstrup, and Græsted churches; Tvillingen (the Twin), a remarkable cluster of trees on a hill in Esrom wood; Nordskov windmill in an elevated position; and Hellebek, a large edifice, yellow with a blue roof, having close by a number of red houses for the workmen at the manufactory; finally, Kronborg castle with its spires, which may be seen 12 or 14 miles, and appears in this direction as if in the midst of the Sound.

Nakke Head Lights.

The two lighthouses on Nakke Head stand W.N.W. and E.S.E. from each other, distant about 438 yards. The lights are Fixed, the western light being 147 feet, and the eastern 98 feet above high water.

Gilleleie Flat.

333. Off Gilleleie there is an extensive flat with irregular soundings of sand with black spots, now and then more rock and shingle. The farther to the westward, and the farther out, the more variable are the soundings; and off Gilbierg Head the depth of 10 fathoms is about 3 miles from the shore.

Baune, Luus, Smidstrup and Eastindia Grounds.

334. Due north of Gilleleie there are several shoals, of which the outermost may be considered as different heads on the same base; these are, the Baune Ground, with 14 feet; the Luus Ground, with 15; the Smidstrup Ground, and the East-

india Shoal, having likewise 15 feet water. Each of these shoals is from 1 to 1½ cables in length, and together they form a crescent, extending N.N.W. and S.S.E. three-quarters of a mile; between the shoals the depth being the same as on the flat, from 3 to 4 fathoms. Farther to the westward there are several other patches of rock of the same detached character, and carrying 3 to 3½ fathoms water; the north-westernmost of them bears N.W. distant 4 cables' lengths from the Smidstrup Ground. On the north and east sides of the shoal the depth very soon increases to 5 and 6 fathoms; but to the westward it deepens more gradually. A floating beacon, with a red staff and one broom, is placed N. by E. ½ E. distant about 270 yards from Smidstrup Ground in 3½ fathoms.

Beacon.

Marks.

When Tvillingen is in one with Gilleleie church, it leads to the westward of the shoals, in 3½ fathoms; to pass to the eastward of them, and to the westward of Söborg Reef, keep Tvillingen open to the eastward of a solitary house between Gilleleie and Nakke Head.

But as Tvillingen, when near the shore, is hidden from view by the intervening land, the following mark may serve:—Blidstrup church in one with a house to the westward of the village of Smidstrup, leads 3 cables' lengths to the westward of all the shoals and of the flat in 5½ to 6½ fathoms, on rock and shingle. The church, just open of the highland of Gilbierg Head, leads clear to the westward of Smidstrup Ground in 5 fathoms minimum depth; and to pass to the southward of the shoals, across the southern end of the flat, bring the farm named Smidstrup Gaard, seen just open off Gilbierg high land, and it will lead between them and the Vesterland Ground in 3 to 3½ fathoms.*

Vesterland Ground.

335. The Vesterland Ground is inside of all the above-mentioned reefs, bearing N. by E. three-quarters of a mile from Gilleleie church, and within half a mile from the beach it has only 10 feet water, and is surrounded by a flat, extending, within the depth of 3 fathoms, a third of a mile east and west, but only 1⅛ cables' lengths north and south. Between the flat and the beach there is a depth of 3½ fathoms; and by keeping open the shore to the westward of Gilbierg Head, or Olhöi open north of Gilbierg high land, the shoal is passed to the northward in 3 to 3½ fathoms.

Marks.

* View 19, 20, 21.

336. The Söborg Reef is more to the eastward, bearing E.N.E. 1¼ miles from Gilleleie church: it consists of a flat with an uneven depth of 3 to 4 fathoms, soundings fine sand and patches of rock, on the innermost of which there are only 9 feet, and surrounded by a shallow patch extending a cable's length within the limits of 2 fathoms. N.N.W., 1⅝ cables' lengths from it there is another patch with 11 feet, and steep-to in 4 fathoms. The whole of this uneven flat extends N. and S. nearly a mile, but E. and W. only 3 cables' lengths. To the southward and to the westward of this flat there are passages with a depth of 5¼ fathoms. *Söborg Reef.*

A floating beacon is placed N.N.E. ¾ E., a cable's length from the shoalest patch; it has a red staff and a red ball to distinguish it from that on the Smidstrup Ground, and lies in 4¼ fathoms. *Söborg Beacon.*

The southernmost and largest hillock near Börstrup, in one with the Sandskredes (a yellow sandy road, leading along a hedge, close to the westward of a copse), and the largest of the Hesbierg hillocks kept the length of the low lighthouse at Nakke Head, to the eastward of the staff, near that light, leads exactly on the southern patch of rocks, with 9 feet water. The lower part of a wood close to the westward of Gilleleie in one with a large wooden tarred building on the beach, and the largest hillock of Hesbierg in one with the low lighthouse, leads exactly on the northernmost ledge of rocks in 11 feet water.

337. Between Gilbierg Head and Nakke Head, at 1¼ cables' lengths from the beach, a narrower shelf lies parallel to the shore, with from 3 to 5 feet water, and with from 9 to 11 feet inside of it; the shoalest part of this shelf being abreast of Gilleleie. From Nakke Head the shelf continues along the coast as far as the Lappe Ground, varying in depth from 2 to 9 feet on the shelf, and from 6 to 13 inside of it. Abreast of Ellekilde Point there is no shelf, but it again rises abreast of Villingebek, and also at Hellebek. *Shelf along the shore.*

338. The Fleske Reef is very small, with 3 feet water, and lies close to the eastward of Nakke Head low light, at the distance of 1⅛ cables' lengths from the beach; and inside of it there is a very narrow channel with 9 feet. Gilleleie church well open of Nakke Head highland, or the Kærnan, at Helsingborg open of Ellekilde Point, leads outside of this reef in 3¼ fathoms. *Fleske Reef.*

Klidderet Reef. 339. Klidderet is a reef 4 cables' lengths from the beach, between Dronninge Mill and Villingebek, with only 10 feet water; it is steep-to in 3½ fathoms on the side facing the shore; but towards N.E. gradually deepening to 4 fathoms. The mark for the shoalest part is the Hesbierg hillock, which has been cut through, in one with the southernmost house on the cliff to the northward of Dronninge Mill, and a grove in one with the westernmost house of Villingebek.

Villingebek Flats. Close to the northward of Klidderet there are some shallows, with 19 and 20 feet water; and another spot with 21 feet water, coarse sand, which lies close to the northward of the line of Nakke Head lights in one. These different shallows are called Villingebek flats.

Lappe Ground. 340. The Lappe Ground is a sandy uneven shoal, on which the depths are irregular; it extends in a northerly direction from Kronborg Point parallel to the shore. On the middle of the shoal are some remains of an old block-house; and a floating beacon, with one broom on the pole, is now placed there in 6 feet water. At the north end there is a red buoy of a conical form carrying a ball; in winter this buoy is removed, and a beacon, with a pole and a red ball, substituted. On the outside, likewise, there are two buoys placed in 20 fathoms, thus affording sufficient warning of the shoal; the eastern buoy is large and pointed, and lies S.S.E. 6 cables' lengths from the north buoy, and which in winter is changed for a red staff with two brooms: the buoy off the south end lies S. ¾ E. from the middle or eastern buoy; it is small, but carries a staff and broom, which, even in the most violent gale, is seen above water: this in winter is also changed for a red pole and one broom.

Beacon and Buoys.

Pass inside of Lappe Ground. The Lappe Ground is separated from Kronborg Point by a channel of some breadth, with 14 to 16 feet water, and even 18 in its narrow part; and further to the northward, between the shoal and the beach, there are from 3½ to 4 fathoms, and even more. Thus this channel affords an excellent refuge to vessels which by stress of weather are driven from the road in a southerly gale, and likewise to those which, after having worked to windward in the slack water behind the shoal, are not able to pass the point: all these may find an excellent stopping-place there.

Kronborg Light. 341. On the northern turret of Kronborg castle there is a

Fixed light elevated 110 feet above the level of the sea, and visible from 4 to 5 leagues.

342. From Nakke Head to Hornbek, about half a mile outside of the shallow water, there is a deep-water channel half a mile wide, with 14 to 16 fathoms over a bottom of bluish clay, the water suddenly shoaling to 6 and 4 fathoms abreast of Villingebek.

343. In the mid-channel the depth is in general 12 to 14 fathoms, bluish clay; but along the Swedish shore, from the Kullen to Wiken, the water shoalens quickly from 11 or 12 fathoms, and the soundings at the same time change to gravel, coarse sand, and frequently stones and shingle. Between Ellekilde Point and Wiken, bluish clay will be found as far out as 16 fathoms, and this depth increases farther out, so that somewhat more than half way over there is a narrow deep-water gully in the bottom, with 20 to 25 fathoms, named the Öretvisten. Off Pålsköp this gully takes a more southerly turn towards Kronborg, and ceases altogether just to the northward of the castle, and nearly in mid-channel. *Mid-Sound.* *Öretvisten.*

This deep-water gully is, however, of great use to vessels in foggy weather, its bottom consisting of coarse sand with shells and stones, and the same kind of soundings are found between the gully and the Swedish shore, whereas on its western side fine sand with black specks are found.

In the Narrows the water shoalens quickly on both sides, but principally on the Swedish side.

344. Though all the marks for the shoals along the Swedish shore have been already stated, it may be convenient to the seamen to find them briefly recapitulated here:— *Turning marks on the Swedish Shore.*

1. Between Mölleleie and Lerhamn you may stand in to 8 or 9 fathoms soundings, coarse sand and stones.

2. From Lerhamn to the southward of Nyhamn tack when the mansion of Krapperup is over the middle of Lerhamn, in 6½ to 8 fathoms.

3. When Wäsby church steeple is in one with the northern edge of the large wood to the northward of Höganæs, Krapperup may be brought to the southward of Lerhamn, you are then 3 cables' lengths distant from the Skars, in 7½ fathoms, rocky bottom.

4. With Wäsby steeple in one with the wood, and until it is in one with the mill to the north of Höganæs, tack in 8 to 11½

fathoms; and in advancing to the southward mind not to allow the eastern highland of the Kullen, in tacking, to come in one with Lerhamn, but keep it well open to the westward.

5. With Höganæs beacon in one with the steam-engine chimney, between Wäsby church and Höganæs mill, and until the beacon is in one with Wäsby steeple, tack when the Kærnan approaches Wiken point, or when the Kullen eastern highland shuts in with Lerhamn, in the depth of 9½ to 10 fathoms, coarse sand, nearly 3½ cables' lengths off the shallow along the beach.*

6. With Wäsby steeple in one with the mill to the southward of Höganæs, the Kulla Gunnarstorp mill is to be kept open of Wiken point, so that you are nearly 3½ cables' lengths outside the Jungnæs rocks, in 8½ fathoms water, coarse sand.

7. From this place, and until Wiken mill and church are in one, you may stand into 8 or 9 fathoms, coarse sand.

8. Abreast of Wiken, after having had the mill and church in one, you may stand in until Kulla Gunnarstorp mill is in one with Gnetaröd, where the depth is 8 to 9 fathoms, coarse sand, at a distance of 2 to 3 cables' lengths from the sunken rocks. It ought to be remembered that the current sets directly towards Svineboen shoal.

9. From abreast of the mill which is to the southward of Wiken, until Nordskov mill is its own breadth open to the northward of Odinshöi, tack in 10 to 12 fathoms, being careful to avoid shutting in the eastern highland of the Kullen (Höikullen) with Wiken Point.

10. With Nordskov mill in one with the northern edge of Odinshöi, and the eastern highland of the Kullen open to the westward of Wiken village, there are 12 to 13 fathoms, rocky bottom, at about 2 or 3 cables' lengths from the shoal part of the Grolle Ground.

11. With Nordskov mill in one with the middle of Odinshöi, and the eastern highland of the Kullen in one with Wiken church, the depth is 16 to 18 fathoms, rocks and shells, about 3½ cables' lengths from the Gnetare Ground; but if the western highland of the Kullen is brought in one with Wiken church, the depth will be only 9 fathoms.

* View 18.

12. With Nordskov mill its own breadth open to the southward of Odinshöi, and the western highland of the Kullen in one with Wiken church, you are 3½ cables' lengths outside the Kulla Gunnarstorp shoal, and will have 16 to 18 fathoms, stones and shells.

13. From that position, and until Pålsköp bears S.E. by E., do not stand nearer the shore than into 15 or 16 fathoms, bluish clay and stones, at 2 to 3 cables' lengths from the shallow.

14. From abreast of Pålsköp, until past Helsingborg, when the Kærnan tower and the church are in one, you may stand in until the westernmost hummock on Salthammar Point is in one with Knähaken Point. Abreast of Pålsköp the depth is then 11 to 13 fathoms, more to the southward 9 to 10, rocky in general, and the distance from the shallow along the shore between 3 and 4 cables' lengths. Until past Pålsköp the western highland of the Kullen may be seen behind the wood at Kulla Gunnarstorp; and proceeding farther southward, the western highland of the Kullen may be seen still farther behind the wood.

Turning Marks on the Danish Shore.

345. 1. Large ships ought not to stand near to Gilleleie shoals so as to bring Blidstrup church in one with the house to the westward of Smidstrup village, before being so far to the northwestward as to bring Tvillingen in one with Gilleleie church; the least water will then be 5½ fathoms, bottom coarse sand, shingle, and rock, and with Tvillingen in one with the church, 9 fathoms, fine sand and sleek.*

2. Blidstrup church is not to be brought in one with the highland of Gilbierg Head before Tvillingen is to the eastward of a solitary house on the cliff between Gilleleie and Nakke Head, you will then be in 8 fathoms water, sand with black specks.

3. When Tvillingen is skreened by Nakke Head you may stand in until Olhöi is one or two ships' lengths to the north of Gilbierg Head, where the depth is 6 to 8 fathoms.

4. In Hornbek Bay do not stand farther in than till Kronborg castle is run behind the shore, the depth will then be 14 to 15 fathoms, bluish clay.

5. Off Ellekilde Point the only danger to be avoided is the shallow off the beach which may be approached in 10 to 8 fathoms, coarse sand.

Views 19 and 20.

6. Nakke Head lights well open of Ellekilde Point, or the highland of Gilbierg Head open of Nakke Head, leads clear to the northward of the Lappe Ground, in 6 to 8 fathoms, yellow sand.

7. From Hellebek to the vicinity of the northernmost buoy on the Lappe Ground, tack in time so as not to run the steeples of Kronborg Castle past each other. With the steeples in one you are only distant 1 to 2 cables' lengths from the shoal, in 6 to 8 fathoms water.

8. On the outside of the Lappe Ground you must tack before the north-west point of Hveen Island shuts in behind Kronborg Point, for those objects are to be always kept open. Vessels drawing little water may approach the shallow along the shore when the largest hillock of Hesbierg is well open to the eastward of the easternmost flagstaff at Nakke Head low-light. Vessels may also stand into Hornbek Bay until the Kærnan is to the eastward of Ellekilde Point, in doing which the least depth will be 19 feet on the shallows.

Working into the Sound with easterly wind.

346. Working into the Sound with an easterly wind, and taking the Kullen close, the above turning-marks will be found useful while on the Swedish shore; but it is to be observed that if the atmosphere is sufficiently clear, the long leading mark along the Swedish shore is the eastern side of the island Hveen, just open of Kronborg Point. Another, and more distinct mark is, to keep the Kærnan just in one with the west point of Wiken, which mark, coming from the northward, may serve until Wäsby church is in one with the steam-engine chimney, half-way between both Höganæs mills; but then you must steer so much to the westward that Kulla Gunnarstorp mill is well open of Wiken Point, before Wäsby church is in one with the mill to the southward of Höganæs. Under such circumstances the floating beacons placed along the shoals of the Swedish coast will prove invaluable to the navigator.

Entering the Sound with westerly wind.

347. Coming in with a westerly wind, and having, as mentioned above, Tvillingen in one with Gilleleie church, and Blidstrup church to the westward of Smidstrup village, the course is E.S.E. ¾ E., in 9 to 10 fathoms, fine sand with black specks and sleek. When Blidstrup is hidden behind the high land of Gilbierg Head, and Tvillingen is likewise behind Nakke Head, the course is S.E., past Ellekilde Point, minding to keep Nakke

Head lighthouses visible outside this point until the north-west point of the island Hveen is open east of Kronborg Point, when the course is S., along the outside of the Lappe Ground; and when abreast of the buoy on the blockhouse it is to be altered to S. by W. round Kronborg Point. If the buoys along the Lappe Ground should not watch, and if Hveen Island should not be seen, take care, when off the north end of the shoal, that the Nakke Head lighthouses are open of Ellekilde Point when the cluster of tall trees in Teglstrup Wood is in one with the southern border of Hellebek Wood; and you may pass to the eastward of the Lappe Ground when the small turret on the platform tower of the castle is kept just in one with the eastern side of the western steeple, being the second in height.

Lappe Ground Pass.

348. To pass inside the Lappe Ground, keep the highest steeple of Kronborg Castle to the westward of the steeple second in height, and yet in such a manner that the lower parts of the steeples are in one, and only the tops apart. On this leading-mark the depth is in general 4 fathoms, and this mark is to be continued until Lappe Lane is open, or until a house called Nicolais Huus is in one with Marienlyst palace; then steer eastward in one of these marks, across the flat which separates the Lappe Ground from Kronborg Point, and the least water will be 17 feet; but it must be remembered that the depth across this flat is said to be somewhat variable.

Entering the Sound with a leading Wind.

349. With a fine leading wind into the Sound, pass the Kullen 2 or 3 miles off, and steer S. by E. until the Nakke Head lighthouses are in one, then keep a point more easterly, yet closing towards the Danish shore, and being careful not to run the lighthouses behind Ellekilde Point before the island Hveen is open to the eastward of Kronborg Point. You may then steer S. by W., and having a steady breeze sufficiently strong to master the current, the point of Kronborg may be taken close, in order to facilitate the communication with Elsinore.

Entering the Sound at night,

350. With clear weather and a leading wind the Sound may without difficulty be entered during the night, guided by the lights of the Kullen, Nakke Head, Kronborg, and the harbour light at Helsingborg. But owing to the uncertain direction of the current, which is frequently strong, it is necessary to ascertain very frequently the ship's place by cross bearings, and this may be

easily done, first by the Kullen and Nakke Head lights, then by Nakke Head and Kronborg lights, and finally by those of Kronborg and Helsingborg.

After passing the Kullen light, it must be kept to the eastward of N. ½ E., and Kronborg light kept in view outside of Ellekilde Point, until the Nakke Head lights are in one, then steer S.E. ½ S. until Kronborg light bears S.S.W., minding by no means to run Nakke Head lights behind Ellekilde Point before Kronborg is on that bearing; and the course should then be S. ½ E. until Kronborg bears W., when you may run for the anchorage as convenient.

Of course, if the wind should happen to come somewhat scant, it is necessary to hug the weather-shore; therefore, if the wind should have veered to the eastward, continue to keep the Kullen N. ½ E. until Nakke Head bears West, then steer S.E. by E. ½ E. until the Nakke Head lights are in one, when Kronborg light must not be to the westward of S. ½ E.; then steer S.S.E. until the Nakke Head lights bear N. W. by W., and Kronborg light S.S.W. ¾ W.; from which place the course past Kronborg is S. by W.

On the contrary, if the wind hauls to the westward, Kronborg light is to be kept S.S.E., open of Ellekilde Point until the Nakke Head lights are in one, then steer S.E. ½ S., minding to keep the Nakke Head lights in sight until Kronborg light bears S. by W. ½ W., whence the course is S. ½ W. past Kronborg. If it be necessary to be guided by soundings, as, for instance, in hazy or thick weather, remember that coarse ground is generally to be found along the Swedish shore, and a finer bottom along the Danish shore, which coast is not to be approached within 9, nor the Swedish within 10 fathoms, until you are sure of being to the southward of Hittarp reef, whence the shore may be approached to 6 fathoms water.

Anchorage off Gilleleie. 351. At Gilleleie the best anchorage for small craft is with the large wooden building (the herring saltery) in one with the inn, in 3½ fathoms, sand and gravel.

Off Dronning Mill. The best anchorage for small craft off Dronning mill is in 3½ fathoms water, sandy ground, which is inside the Klidderet, and about N.N.E. ¾ E. from the place where fire-wood is embarked; the mark for this anchorage is, the mill just to the northward of Helsingborg in one with the point of Ellekilde, or

with the largest of the Four-hills* to the southward of the Hulerŏd or Hammar-house, which is a large and conspicuous farmhouse to the westward of the above-mentioned shipping-place.

352. Vessels drawing little water ought always, when anchoring in Villingebek Bay, to keep Gilleleie church in sight to the eastward of Nakke Head, where the depth is 4 to 6 fathoms, sand and gravel; when the church is shut in behind the point, the bottom is rocky towards the shore. Between Villingebek and Hornbek the Kærnan Tower ought to be kept just to the eastward of Ellekilde Point, where the depth will be 4 or 5 fathoms, sand, but farther in, rocks and shingle. Large ships will find the best anchorage pretty well to the northward in the bay to the westward of Hornbek. When Kronborg castle is just in one with Ellekilde Point you are on the inner edge of the deep-water channel, in 13 to 15 fathoms, bluish clay, to the eastward of Hornbek; and St. Olai church tower in Elsinore, having no steeple, is to be kept well open with Ellekilde Point. This bay is a common resort for the numerous large vessels obliged to anchor, in order to wait for a favourable wind or current. It is very fit for that purpose, and the more so as pilots are near at hand. Smaller vessels may find good anchorage inside the Lappe Ground, abreast of the suburb of Elsinore, in 3 to 4 fathoms sand. *Hornbek Bay.*

353. In choosing an anchorage in the extensive road of Elsinore, several circumstances are to be taken into consideration, viz., the season, the wind, and the weather, as well as the intention of remaining a long or short time there, and according to the number of vessels in the road. The chief danger, and one that frequently occurs, is, the running foul of other vessels; for it should be remembered, that, according to the Danish laws, a vessel running foul of another at anchor is liable to pay all the damage. The best anchorage is on the Disken Bank, where the holding-ground is so tough that it sometimes has proved extremely difficult to get the anchor up. Ships of the line ought not to come to on the shoalest part of the bank, where the depth is only 23½ feet. The proper anchoring marks are, Kullen Point in one with Kronborg Point, and four solitary stunted trees, stand- *Elsinore Road.* *Disken Bank.*

* These four hills stand close together, and the largest is the northernmost.

ing in an elevated position in the fields belonging to Borup farm, in one with the inn in the village Snedkersteen. The anchorage most to be preferred is in 4 or 5 fathoms, with the highest land of the Kullen open to the eastward of Kronborg Point. From thence it is always easy to get away, if not encumbered by the numerous vessels at anchor there. Vessels riding there, in strong gales, which are generally accompanied by violent currents, are however, more exposed to being run foul of in that than in any other part of the road. It is, nevertheless, most to be recommended with a southerly wind; and if coming from the southward, there is plenty of room to bring up in such a manner as to avoid all vessels riding there. But when running in with a north-west gale, and its common attendant a strong current from the northward, our advice is to keep close round Kronborg Point, and to proceed along the shore, in smooth water and a slacker current, until past Snedkersteen, a village rendered conspicuous by the inn, a pretty large whitewashed building, with a semicircular front. There excellent anchorage will be found in 6 to 8 fathoms, with good holding-ground, perfectly sheltered from northerly and westerly winds, and there vessels may ride out a southerly gale, or, if the cable should part, get away to the northward.

Many vessels under the above circumstance do not run so far southerly, but bring up in the vicinity of the guard-vessel, between the Disken and the harbour in 11 to 15 fathoms water; this, however, is imprudent, because the holding-ground is not only indifferent in itself, but it has been furrowed as if with a plough, by the number of vessels that have anchored there. They are also liable there, with a N.W. gale, to drive foul of the moorings of the guard-ship, as her anchors are 2 cables' lengths apart, in a N. by W. and S. by E. direction, and thereby run the risk of losing their own anchors, as well as of doing damage to others.

Current. 354. As mentioned before, the current from the southward runs most strongly in this bay, and increases on approaching the point, where it is so violent, that vessels weighing with the wind a little to the eastward of the direction of the current, for instance S.S.E., are obliged to take the port tack, and yet have neither room enough to get sufficiently headway in order to tack off shore, nor to wear in time to weather the point, and thus are obliged to

anchor again, instead of proceeding on the voyage, though favoured by the fairest wind; they are moreover in a very precarious situation, at anchor close to the beach, and not able to get underway, without the expensive assistance of men and boats from the shore. It is doubtful, likewise, whether vessels anchored there would be able to weather Kronborg Point in a southerly gale, the most dangerous wind in that road, if the cable should part, or if it should be found requisite to slip, in order to avoid being run down by another vessel. Some vessels prefer anchoring just inside the Narrows, between Elsinore and Helsingborg, in 10 or 12 fathoms, particularly when the road is crowded; but this anchorage, besides being greatly exposed during the night to collision with vessels coming from the northward, is also open to N.W. winds, which sometimes blow violently, and against which good shelter may be found farther in. However, as vessels *may* ride it out there, and in good holding-ground, and in case of any accident may run for shelter behind the island of Hveen, that anchorage cannot, on the whole, be pronounced dangerous: it is besides easy of access in coming from the northward, and there is less chance of running foul of other ships in bringing up.

It ought to be remarked, that in a N.W. gale Kronborg Point produces smooth water across the Sound in a S.E. direction; but that along the edge of this smooth space the waves break with such violence that vessels anchored there ride much more uneasily than if anchored farther out.

355. We advise vessels coming from the southward with a fair wind, and having no other business than to pay duties, not to anchor if it is blowing stronger than a good breeze, but rather to employ one of the ferry-boats, which will offer their service 4 or 5 miles to windward of Elsinore. For a moderate sum the boat will take the master or the mate ashore, while the vessel stands off and on, during the 3 to 4 hours generally required for clearing at the custom-house. The trouble and risk are thereby avoided of anchoring and of using the vessel's small boats in a rough sea. If, however, anchoring be preferred, let it be on the south-end of the Disken, to the southward of the vessels riding there, notwithstanding the greater distance from Elsinore.

356. It is evident that the most dangerous winds in this road are from the southward, between S.S.E. and S.S.W., and that a S. by W. wind, which is the direction of the Sound, may be con- *Winds.*

sidered as the very worst, for it likewise occasions a high short sea, because the current, which in some degree smooths the sea, yet always runs stronger when the wind is to the eastward of south, than when it is to the westward of it.

Vessels that part from their anchors have more difficulty in weathering Kronborg Point with the wind to the eastward of south, but at the same time more facility in getting into the harbour of Elsinore, which offers a refuge to vessels not drawing more than 16 feet.

Elsinore Harbour. 357. To enter Elsinore harbour, the helm must be very minutely attended. The southern pier-head, which is whitewashed and provided with a light, must be taken quite close, as there lies the deepest water; and do not take in sail too soon, lest the ship, wanting sufficient headway, might be forced by the current on the shoal extending from the glacis of the castle, on the north side of the harbour's mouth. To avoid this shoal, keep the high mill to the southward of the town, just open to the westward of the large custom-house store. When abreast of the pierhead, furl sails as quickly as possible, and steer W.S.W. into the harbour, when the vessel will speedily lose her headway.

Harbour Light.

In this harbour damaged ships may be hove down and repaired, and the market in the town is furnished with all sorts of naval stores equal to those at any other place in the world. It has also an excellent watering-place in a house, alongside of which boats may come to fill their casks, by the means of a hose. The victuals for the crews are to be cooked on shore in houses erected for the purpose, and lights are allowed on board until ten o'clock in the evening. Vessels wanting hands may always pick up recruits here.

Pilots. 358. Regular pilots are to be had here, not only to take charge of vessels past the Kullen and Dragör, but to all the Danish and Swedish harbours in the Sound.

Ferrymen. 359. A corporation of ferrymen, possessing 70 boats, are constantly on the alert, and ready to perform any service in the road, for which regular fees are stipulated. The courage and skill of these ferrymen in managing their boats, even in a complete storm, is well known to all seafaring men.

Steam Tug. At Elsinore there is a royal steam-tug, which, when requested, tows ships through the Narrows or further, at a regulated fee per hour.

Custom-house hours. The hours at which vessels may be cleared at the custom-house vary according

to the season, but they are announced by a gun fired in the morning and the evening from the guardship. From this ship the instant of Greenwich mean noon is made known every day by the dropping of a ball; and the mean time at Greenwich, for rating chronometers, will at any time be communicated. *Greenwich Time.*

360. Neither here nor at Kronborg castle is a vessel required to salute by lowering sails; all that is necessary is to show her colours in passing, and, if this is neglected, she will be fired at, and made to pay the expense. *Salutes.*

361. Every vessel must be reported at the quarantine office at Elsinore before a free communication with the shore is granted; all other modes of admission are unlawful, and the transgressor is liable to pay a fine. Accordingly, masters of vessels are hereby warned not to land at any other place, nor to go ashore at Lappen, if prevented by wind and current from passing Kronborg Point. At a given signal a ferry-boat will attend and carry letters and ship-papers to the quarantine-office at Elsinore, and then to the respective consuls or agents. The quarantine office at Elsinore is authorized to issue legal bills of health, which are recognised in Russian, Prussian, and Mecklenburgh ports. Vessels only liable to a few days of observation quarantine, perform it in Elsinore road, under the guard-ship's inspection, and accordingly ought to be anchored in her vicinity; but vessels coming from places visited by the plague or other infectious disease, with a cargo which, according to the regulations, should be discharged, are ordered to repair to Kyholm, off Samsö, there to perform the quarantine to which they are liable. If only a small part of the cargo is considered as infectious, a permission may be granted to send such goods to the quarantine place at Kyholm, by another vessel, and the ship in question, after having performed the proper observation quarantine, is then allowed to proceed on her voyage. *Quarantine.*

362. Regarding the departure from Elsinore road to the northward during the boisterous autumnal season, it has frequently been advised, that vessels ought not to leave the road with any wind to the westward of south, because such winds at that season of the year always veer to the northward farther down the Kattegat, so as to be frequently found N.W. off the Skagen, by which means vessels having a scanty wind on both tacks might be exposed to be carried on the lee shore of Sweden. It is true that *Sailing from Elsinore.*

such a change of wind does frequently happen, and even is common in autumn; but it is equally true that the dangers of the Swedish shore have been greatly exaggerated, for there are many places of refuge there, and among them some of easy access, and improvements have been made all along the coast to render the navigation safe; besides which pilots and fishermen familiar with the localities are almost everywhere to be found.

There appears, therefore, to be no good reason for remaining in Elsinore road, and losing a favourable opportunity for passing the Kattegat. The current will often give the best advice of the state of the wind in the northern part of the Kattegat, for as long as it runs to the northward in the Sound there are probably N.W. winds off the Skagen. While that current runs, therefore, we recommend vessels to proceed on their voyage through the Kattegat, that is to say, if the wind is favourable, and if the barometer does not decidedly indicate bad weather. But we would dissuade vessels from leaving Elsinore with the intention of repairing to the anchorage inside the island Wäderö, there to await a fair wind, as recommended in some sailing directions of a recent date. Elsinore road affords shelter against all winds that are not fair through the Kattegat, and though, it is true, that at Wäderö a vessel would be more to windward with an easterly wind, yet the current from the southward, which generally accompanies that wind, greatly facilitates the working to windward in the Sound.

Ice. 363. It is only during severe and long-continued winters that the Sound is covered with ice, and this but seldom lasts for any length of time, as the current generally cuts the ice very suddenly in mid-channel, and thus leaves an open passage. Now and then the ice is seen piled up to a considerable height on Kronborg Point.

In the spring, when the ice pours out from the Baltic, it may sometimes greatly annoy the shipping in Elsinore road, for it frequently fills the bay to the southward of Kronborg, and thus blocks up the entrance to Elsinore harbour. During the season in which drift ice may be expected, vessels do well to come to an anchor on the bank of Disken, where the holding-ground is good, where they are the least exposed, and from whence they have the best chance of getting away.

The Sound above Elsinore. 364. To the southward of Elsinore and Helsingborg the opposite

coasts of the Sound continue to differ, though in a less degree than to the northward of the Narrows, the Swedish shore losing its mountainous, or at least its elevated character, but still entirely destitute of wood, whereas the Danish shore is adorned with trees as far as Kiöbenhavn (Copenhagen.) The island of Hveen, mid-channel, is pretty high, with steep shores, and with the conspicuous church of St. Ibbs on its western shores. *Hveen Island.*

365. The shallow along the beach from Elsinore to Snedkersteen is narrow and steep, with rocks along the beach; but to the southward of Snedkersteen it enlarges and forms Nivaa Flat. Abreast of Nivaa, the 4 fathoms line of soundings is 2 miles from the shore, but the bank again narrows from that place to Vedbek, where 4 fathoms are found 2 cables' lengths off shore. There it once more expands, and forms the Taarbek flat, with a clean sandy bottom, abreast of the large village of that name, which is inhabited chiefly by fishermen, and inshore of which the royal pavilion of Eremitage may be seen in the park. *Danish Shore.*

366. The pier of Humlebek, erected near a group of fishermen's houses, is the only harbour in this whole interval of coast, and its depth by laborious dredging is kept at 7 feet. The entrance is marked by poles carrying brooms, and on the pier-head there is a beacon; E.N.E. from the pier, distant half a mile, lies the wreck of a line-of-battle ship, the Siælland, over which there are 14 feet water, and on the middle of which there is a floating beacon. Small craft, in order to avoid the current, often cross the Nivaa flat and close the shore; but they should take care of the ruins of a pier for galleys that was formerly erected here, and the remains of which are now about 2 fathoms under water. *Humlebek Harbour.* *Wreck.*

The best anchorage on Nivaa Flat for small vessels is in 3 to 3½ fathoms, with the southern edge of the wood of Hegn bearing W. by N. *Nivaa Flat.*

At Rongsted there is a wooden pier for boats, and at Vedbek a stone pier, but with water only for small row-boats. There is also a custom-house at the latter named Alexandria. *Rongsted.* *Vedbek.*

367. Abreast of Vedbek, distant 2 miles from the shore, is the Lous Flat, on which there are 4½ to 5 fathoms water, with uneven soundings all round it, and from 6 to 7 fathoms between the flat and the beach. The Frelser (Saviour's) church is the highest and easternmost church in Copenhagen, and when in one with *Lous Flat.*

the custom-house, which is also a high building, leads exactly over the shallowest part of the flat.

Swedish Shore. 368. The shallow along the Swedish shore, between Helsingborg and Landskrona, is in general steep and rocky, and between Helsingborg and Råå (a large village inhabited by fishermen) the white sandy bottom is visible through the water as far out as 2 fathoms.

Knähaken Reef. 369. A small sandy spit, called the Knähaken, 2½ miles to the southward of Helsingborg, extends to a distance of 5 cables' lengths from the beach: the mark to pass outside of it in 5 fathoms is, to keep Glumslöf church, which is on high ground, open to the southward of the tile-kilns, on the beach at Ryabek.

Råå. Off Råå there is a flat with 8 to 6 fathoms, clay, on which good anchorage may be found at three-quarters of a mile from the

Salthammar. shore. Off the remarkable point of Salthammar extends a small shallow.

370. Abreast of Erikstorp mansion there is a small shoal,

Gette Reef. called Gette Reef, on which are only 2 feet water, and inside of it 8 feet; to pass just outside the shoal, the turrets of Landskrona church are to be kept well outside the southernmost of the Borsta Houses, which stand on the shore, 2 miles to the northward of the town.

Landskrona. 371. Landskrona has an excellent harbour, in which vessels of any size may winter in safety; ships may also be hove down and repaired, but the entrance is narrow and intricate, with from 10 to 5 fathoms water between the shallow along the beach and the

Vester Flat. extensive flat called the Vester, which to the southward unites with a beach-shallow. This flat stretches off to the distance of 3 miles from the town, and contains two separate shoals, viz., the Pilhaken, with 7 feet water on its north end; and to the southward the Val Ground, with 5½ feet. The Kærnan tower at Helsingborg in one with the east point of Hveen, leads nearly a mile to the westward of the flat; and St. Ibbs church open to the westward of the south-west point of Hveen Island clears it more than half a mile. The northern extremity of the Pilhaken is marked by a white buoy with a black cross, which is to be left to the westward. Two cables' lengths to the southward of this buoy, a small beacon stands on the eastern edge, and is therefore also to be kept to the westward. Six cables' lengths inside of the Pilhaken buoy the channel suddenly takes

an easterly direction round a projecting point of the shallow called Nardhaken, and marked with a black buoy, which of course is to be kept on the port side. Two poles serve as guides into the entrance, the highest one 78 feet above the level of the sea, is on the rampart of the demolished fortress, the other one 55 feet, at the bathing-house. With the north-east point of Hveen Island bearing N.W. by N., and Sophienberg (formerly a royal palace) in Sælland, open to the southward of Hveen, as well as Dagstorp church open north of Landskrona church, you are right before the entrance, and in a good roadstead, with 7 to 8 fathoms water, and 1½ miles from the town; but to enter the harbour it is necessary to take a pilot. A Fixed light is shown on the north side of the entrance. From the southward there is no entrance to the harbour, the shallow extending 2 miles from the shore, and having many large rocks, some of which show themselves above water; this part of the shallow being called the Skab Reef. *Landskrona Harbour light.*

At Landskrona fresh water is scarce, and if a considerable quantity be wanted, recourse must be had to the watering-place at the rivulet of Suseaa, distant 2 miles from the town.

372. Between Landskrona and Hveen is Staffan Flat, but on its shoalest part there are 6 fathoms water, over shingle, sand, and clay. From this flat Elsinore church is seen open to the north-east point of Hveen, Sophienberg likewise well open to the southward of Hveen, and Dagstorp church to the northward of Landskrona church. The shoal-water on this flat makes it a convenient stopping place; and close round it there is deeper water than further off. *Staffan Flat.*

373. The shallow all round Hveen is very narrow; but on the north side it is 2 cables' lengths wide, and therefore with southerly winds small craft may anchor there. The best place is a little to the westward of the village of Tuna, with St. Ibbs church bearing S. by W. and a full cable's length from the beach in 2½ to 3½ fathoms water. On the north-east side the deep water comes close to the shore, for at 3 cables' lengths from it there are 22 fathoms—the deepest water in the whole of the Sound. Off the N.W. point a reef extends to the distance of a quarter of a mile, at the extremity of which the depth suddenly drops to 14 fathoms. Small vessels pass outside this reef, by keeping the roof of St. Ibbs church fully visible over the cliff. *Hveen Island.*

The Sound divides into two Channels.

374. Hveen Island divides the Sound into two separate channels, of which the eastern one is the deepest, and the western one the widest and most direct tract to the Baltic. The latter is also better sheltered in the prevailing westerly winds; and it offers everywhere excellent anchorage in a moderate depth of water, as well as lights, beacons, buoys, and skilful pilots. It is accordingly the most frequented by all the Baltic traders, and ought to be always chosen, except in the single case, which, however, rarely occurs, of vessels bound to the southward finding the current in their favour; for that always begins earlier, and ceases later, along the Swedish shore. But even with the current setting to the northward vessels may find an advantage in adhering to the eastern channel, as it never runs so strongly there as along the Danish shore. In beating through the eastern channel, however, vessels have to beware of the shallows extending far off Landskrona, towards which the current always sets.

W. Channel.

In using the western channel, anchorage is to be found throughout, and the shallows along the shore may be everywhere approached by the lead, only observing that when large vessels stretch into Nivaa Bay, they ought not to bring Kronborg castle more easterly than N.N.E. ¼ E.; 2ndly, that line-of-battle ships ought to avoid the shoal part of Lous flat; and, finally, that all vessels must give a berth to the shallow spot on Taarbek Flat.

Taarbek Flat.

375. Off Taarbek sandy flat the 4 fathoms edge extends nearly 2 miles from the shore, and the general depth is 3 fathoms. It may be crossed by all middle-sized vessels, only taking care to avoid the wreck of the line-of-battle ship Neptune, on the outer extremity of the shoal, where there are now but 13 feet water. A black buoy with a pole and broom in 4 fathoms is placed on the east side of the wreck on the 1st of March, if not prevented by the ice; and like all other marks, is removed on the 21st of December. At this buoy, marked 6, Kastrup mill is seen close to the east of Sundby Grove. When the mill is in one with the grove you are inside of the wreck, and by keeping these objects somewhat open you pass outside of it. The Eremitage in one with the edge of the wood to the northward is the mark for the north side of the flat; and in one with the edge of the southern wood is the mark for its south side; finally, the pavilion in the middle of the opening between the woods marks the eastern extremity of the flat. Coming from the northward,

Wreck and Beacon.

with a vessel drawing too much water to cross the Taarbek flat, the whole of the city of Copenhagen must be kept in sight outside of Skovs Head, and then the highest and easternmost steeple on Copenhagen, that on the Frelser church, is to be in one with the north easternmost masting-crane in the navy-yard at Nyholm, before the Eremitage becomes visible to the southward of the northern wood, which mark leads outside the reef in 4½ fathoms. This edifice, like the masting crane at Christians Holm, consists of a high square tower, with sheers and tackles to heave up masts, boilers, &c. During the night do not stand nearer in than 5 fathoms, or until the light on the Tre Kroner battery bears S.W. by S., and by no means more to the southward.

376. The shallow along the shore continues to be of some extent until past Skovs Head, where it becomes narrower, and forms an entrance into the Skude channel, which, however, is only a blind passage between the shore and the Stubben (a bank extending from the shore to the N.E.) till Gientofte church comes nearly in one with Constantia villa, on the beach. Vessels not able to pass the Stubben (on the shoalest part of which there are only 11 feet water), must keep Tre Kroner light to the westward of S.W. by S., which is likewise the course from the floating beacon on the Taarbek flat, to the buoy on the Stubben. This buoy is placed on the N.E. end of the shoal, in 22 feet; it is painted black, and marked No. 7. The marks for it are, Frelser church in one with the south-western masting-crane on Christians Holm, and the royal pavilion at Charlottenlund, visible through one of the avenues traversing the wood. Large ships ought, therefore, to pass to the eastward of the buoy, and if obliged to wait for a pilot to take the ship to Copenhagen, they may stand off and on between the buoy on the Stubben and that on the Middel Ground, minding not to stand nearer in than 4 fathoms on either side, and to tack off the Stubben when Nicolai watch-tower is in one with the west side of the military academy. By approaching the Stubben, until Frederik church is a little to the eastward of the storehouses at the custom-house, the water shoals to 3 fathoms, and when in one with the storehouses the depth is only 16 feet. *Skude Channel.* *Stubben Bank.*

When past the south-eastern extremity of the Stubben, a good leading mark to Copenhagen is, to keep Amalie Street open, which will lead through the principal inlet, between *Copenhagen.*

Tre Kroner battery and the Ruggen shoal, close to the buoys placed on both sides of the channel leading to the inner port. On this mark the least depth across the south-eastern extremity of the Stubben is 17 feet. Vessels requiring a greater depth may enter by the Krone channel, between the Stubben and the Svane Ground, another shoal to the southward of the former, by keeping the blue-tiled house of Rolighed, behind the southernmost or old lime-kiln in one with the north end of this lime-kiln; or by keeping Helliggeistes church so near to the castle mill that its wings are in one with the steeple, until Amalie street opens, or until Frelser church steeple is midway between Christians Holm crane and the guard-house at the entrance to the port. This may likewise serve as a leading mark for the entrance, in working in, as the church may be run towards the crane on one side, and towards the guard-house on the other.

Krone Channel.

On the mark, the western edge of Frelser church steeple, just to the eastward of the above-mentioned guard-house, there are 22 to 24 feet water from where the westernmost mark passes the Tre Kroner battery to the entrance of the Bommen port, so named because a boom bars the entrance during the night.

Copenhagen Harbours.

377. The inner harbour of Copenhagen is formed by the channel between Siælland and Amager, and the outer harbour by the banks off those islands, viz., the Stubben, and a shoal reef, named Revshalen. The latter shelters the harbour against the easterly winds, and by the shallowness of the water renders it perfectly safe. On the Revshalen stand two artificial islands, the Tre Kroner battery, and the Quarantine establishment called the Lunetten; and the passage between the Revshalen and Stubben is called the Krone channel. On the north end of the Revshalen, in 18 feet, there is a black buoy, marked No. 8, called the Kroner buoy; and this, together with two floating beacons with brooms on their tops, indicate the remains of the ships which formed the *old* Tre Kroner battery. The Svane Ground projects nearly 2 cables' lengths to the N.N.E. of the Kroner buoy, with an uneven depth of 18 to 23 feet, so that its north-eastern extremity is 4 cables' lengths from the N.E. point of the Tre Kroner battery; consequently the Krone channel, between the Svane Ground and the Stubben, is only one cable's length across, but carrying in the mid-channel a depth of 5 fathoms. Farther in there is less water, as represented in the chart.

Revshalen.

Lunetten Quarantine Establishment.

378. Inside the Tre Kroner battery the 3-fathoms channel is wider, but divided into two distinct passages by the Ruggen, a shoal with a hard bottom, and 15 to 17 feet water; this shoal is nearly 4 cables' lengths long, and 3 quarters of a cable across. The principal passage is that to the eastward of the Ruggen, being nearly straight, and having about 22 feet mid-channel, with a soft bottom. The passage to the westward of the Ruggen is called the Jyde Renden, and is narrower than the other, with less water and rather crooked, but it likewise has a soft bottom. The space between the Ruggen and the entrance to the inner harbour is called the Outer Harbour of Copenhagen; it is half a mile in length, and one cable's length across, with a depth of 3 fathoms to 22 feet, mud bottom, and sheltered from all winds. On its eastern side there are two, and on the western side three, large warping-buoys, in 15 feet water, from which vessels may make sail; and inside of these buoys, along the west side of the channel there are three dolphins painted red, standing in 15 to 17 feet water.

Kroner Channel. *Jyde Channel.* *Outer Harbour.* *Warping Buoys and Dolphins.*

379. Outside the dolphins, and abreast of the inner buoys on the western side, a green flag on a short wooden pier announces the quarantine office. Vessels liable to perform quarantine are under the control of the Tre Kroner battery, and have to repair to the outermost end of the Jyde Renden. No gunpowder is allowed on board vessels when inside of the Lunetten, or Lazaretto, nor any kind of fire when anchored inside of the outermost dolphin, steam-boats excepted, which are permitted to get up their steam in the outer as well as in the inner harbour.

Quarantine Office.

Damaged vessels may find in Copenhagen every kind of assistance, excellent provisions in abundance; and many of the Baltic traders stop there, to victual.

Supplies.

380. The greater part of the Baltic traders pass through the Sound, and between the islands of Amager and Saltholm, but both of them are very low, and surrounded by extensive sandy flats, with here and there rocks which considerably limit the passage. This passage is farther incumbered by an extensive shoal, called the Middel Ground, which is 3 miles long, and fully a mile across, with but 10 feet water on its shoalest part. It divides the passage into two channels; the western one lying between the shallow of Amager and the Middel Ground, and as it includes the outer road of Copenhagen, is there called the Renden; but

Middel Ground.

Konge Deep. to the southward it takes the name of the Konge Deep. The other passage lies to the eastward of the Middel Ground, between it and Saltholm, and is called the Hollænder Deep till it unites with the Konge Deep. They both then take the old Dutch name of the Drogden, from its shallow water, to the southward of Dragör village, where the depth is only 23 feet with a common waterstand, and on the actual state of which it depends whether ships of a heavy draught may pass or not. The northern part of the Drogden is deep; and the Hollænder Deep being deeper, wider, and straighter than the Konge Deep, is commonly preferred by the Baltic traders, especially with easterly winds.

Drogden Channel.

All these channels, however, are so narrow and intricate, that every vessel ought to take a pilot, either at Elsinore or Copenhagen; or, when coming from the southward, at the Dragör light-vessel. The pilots go by accurate marks on the shore, or by beacons on the shoals, which are all truly represented in the chart, but a minute description of them would not be understood by navigators unacquainted with the localities, and therefore would be of no use here. As general directions, it will be sufficient to observe, that only three of the churches in Copenhagen have spires, viz., the Frelser (or the Saviour's church), which is the highest; Frederik church, the next in height, both of them standing in the south-eastern part of the city; and Petri church, the third spire, in the western part of Copenhagen. The churches without spires are the Frue (our Lady's), which is the cathedral, white, and carrying a gilt cross; Trinity, or Round-church, having a circular grey tower; and Nicolai, which was formerly a church, has a square tower, painted in some Gothic style, and red with white stripes. The church of Gientofte, a village to the northward of the city, and Taarnby church on Amager Island, have no steeples; but the village of Hollænder, on the same island, has a church with a small spire. On Amager there are several small groves, or plantations, called *remises*, which are surnamed after the villages in their vicinity, and serve as piloting marks. On two small hummocks, at the north and south ends of Amager, marks have been erected, that on the north hill presents a 6 feet square surface towards the Hollænder Deep, as a mark for that channel. Close to the northward of Dragör village there are two more marks, called the Pillars,

which are of great use. But as these marks, together with a great many other objects serving as such, do not afford sufficient guidance, even for the pilots, particularly in thick or hazy weather, it has been found necessary to mark out more distinctly the channels by buoys and floating beacons, placed according to certain principles, so as to enable even a stranger, unacquainted with the localities, to guide his vessel, if happening to be there without a pilot; and these we shall now describe:

381. All the buoys are placed on the western sides of the channels, and are marked in Roman numerals, as follows: *Buoys.*

Dragör Buoy, No. I., nun, black, in 18 feet water.

Kastrup Buoy, No. II., nun, black, in 18 feet on the western side of the Drogden.

Middle Ground South Buoy, No. III., nun, black, in 22 feet.

Middle Buoy, No. IV., nun, black, in 18 feet; and

North Buoy, No. V., nun, red, in 23 feet, both on the eastern side of the Middel Ground, and on the western side of the Hollænder Deep. This buoy is larger than the others, and carries a vane.

382. The buoys numbered with common figures, are the

Neptune Wreck Buoy, on Taarbek Reef, No. 6, barrel, black.

Stubben Buoy, in 22 feet water, No. 7.

Krone Buoy, No. 8, barrel, black, placed in 18 feet on the west side of the Konge Deep, but principally leads by the Krone Channel into Copenhagen.

The above Buoys, Nos. I., II., III., IV., V., and No. 7, are pretty large, and No. V. the largest of all: they are nun-buoys, except Nos. 6 and 8, which have the form of a barrel. They are all black, and marked with white figures, except No. V., which is red, as mentioned above.

383. Green Buoys are placed on several wrecks; one on the wreck of the line-of-battle ship the Infödsretten, and another near the wreck west of the Middel Ground, lying in 7 fathoms, and carrying 31 feet water.

384. The better to distinguish the channels, floating beacons, with brooms on the tops of 7 feet poles, are placed on the edges of the shallows. All those on the western side of the channels have brooms tied upwards on black poles, whereas those on the eastern side are on white poles with brooms tied downwards. On the same principle a floating beacon with a white pole, and *Floating Beacons.*

one broom tied downwards, lies off the western side of the Lille Ground, and another on the Bred Ground, to the southward of the former; but, to prevent any mistake of the one for the other, the latter carries a ball, and the pole is painted black and white, at intervals of a foot.

The following floating beacons lie in the channels leading to Copenhagen:

385. On the eastern sides of the channels, floating beacons with brooms tied downwards, and white poles; one on the western side of the Middel Ground in 20 feet; one on the shallow off Saltholm Island abreast of Lusen Point in 4 fathoms; and one on the shoal named the Kraase-bank in 4 fathoms.

386. On the western sides of the channels, floating beacons with brooms tied upwards and black poles; one on the Svalerumpen shoal in 4 fathoms; one on the shallow of Sundby-hage in 4 fathoms; and one on the east side of the Stubben in 4 fathoms.

387. And on the insulated shoals, floating beacons with balls or baskets, as follows:

One on the shallowest part of the Knoll shoal, in 14 feet. One to the N.W. of the shallowest part of the Ruggen, in 4 fathoms. One on the shallowest part of the Middel Pulten, in 20 feet. And four fixed beacons are placed on the wrecks of the Prövesteen battery, which formerly consisted of three ships of the line; but they have been sunk and cut down even with the water's edge, and the present beacons shall be described in Article 390.

Lights.

388. The lights hereabouts are, the Fixed harbour light on the Tre Kroner, 30 feet above the sea, and that of the light vessel in 4½ fathoms, at the southern entrance of the Drogden, which also is Fixed, and 25 feet high. That light vessel, which likewise serves as a station for pilots, is schooner rigged, painted red, with a white cross on each side, and carries a ball on the foremast. In thick, rainy weather, or in a fog, a bell is tolled 10 minutes at a time, with intervals of 5 minutes.

Season for planting the Lights, Buoys, and Beacons.

This light vessel, as well as all the buoys and beacons, are annually placed in their respective stations on the 1st of March, or as soon after as the ice permits, and are removed on the 21st of December.* During the winter season four floating beacons

* Formerly the floating-beacons in the Konge Deep as well as in the

only are allowed to watch, viz.: one in the place of the Dragör buoy; one on the North Röse; one on the South Röse; and one on the Holmetunge, south-west of Saltholm; and if these beacons are swept away by the ice, they are replaced as soon as possible.

389. The Konge Deep is bounded on its eastern side by the Middel Ground, and to the westward by the Stubben, the Revshalen, and the Shallow extending off Amager. Owing to the form of the Middel Ground, the channel makes a sudden bend abreast of the Tre Kroner, first running S.W. and then S.S.E. The depth is everywhere from 6 to 9 fathoms, except on a small, detached reef, called the Middel Pulten, which is covered with sea-weed, and in some spots carries only 20 feet water. This shoal is just mid-channel, and somewhat more than a cable's length N. and S., but rather less from E. to W. To pass close to the westward of this shoal, keep Frederik church to the west of the masting crane in the navy yard, at Nyholm; and to pass it to the eastward, keep the Eremitage a little eastward of the inn of Skovshoved village. To clear it to the northward, keep the loftiest turret of the royal palace of Rosenborg (in the city) in one with the flagstaff on the Tre Kroner; and to the southward, keep Frue church, or cathedral, in one with the northern edge of the Lunetten. *Konge Deep.* *Middel Pulten.*

390. Besides the buoys Nos. V., 7, and 8, mentioned above as pointing out the entrance of the Konge Deep when coming from the northward, and No. III. when coming from the southward, there are four beacons in the narrow part of the channel, on its western side, showing the remains of the old Prövesteen batteries: they consist of two poles 10 feet high, painted green, carrying black balls, and driven into the ground at either end of the old battery, about 30 fathoms apart; and of two others on the old

---

Drogden, carried one broom only; but in the spring of 1851 the following changes were made in their arrangements:—

In the Konge Deep.—The middle beacon, on the Middel Ground, two brooms; and the southern beacon three.

In the Drogden Channel:—

The Svalerumpen beacon	two brooms.	
North Röse	,,	three ,,
South Röse	,,	two ,,
Sandreef	,,	three ,,
Holmetunge	,,	two ,,
Lusen	,,	three ,,

inner battery, 17 feet high, each carrying a ball, but placed over a plane shaped like an upright buoy. Finally, on the N.E. extremity of the Sundby Hage, in 4 fathoms, there is a floating beacon, with a pole and broom tied upwards on a black staff.

391. Again, on the eastern side of the channel, and close to the edge of the Middel Ground, there are two floating beacons near the wrecks of foundered vessels; the northernmost of these wrecks lies in 4½ fathoms, and has only 21½ feet water over it; and the other is in 5½ fathoms, the depth on the wreck being 22 feet. Between these wrecks, but at some distance inside of the edge of the Middel Ground, there is a third wreck, having but 6 feet water over it, but marked by a large buoy, in 12 to 14 feet.

Marks for the Konge Deep.

392. Coming from the northward, the mark for entering the Konge Deep is Nicolai tower in one with the Tre Kroner battery till abreast of the northernmost of the two lime-kilns, bearing W. by N.; then, being between the Svane Ground and the Middel Pulten, the course through the channel is S. by E. until Gientofte church is nearly in a line with the middle of the Tre Kroner battery, which then becomes the leading mark to the southward, passing the southern buoy of the Middel Ground, and into the Drogden, till the Round-church tower is in one with Stricker battery. Coming in through the Drogden, and going through the Konge Deep to the northward, the same mark, viz., Gientofte church half-way between the middle and the eastern edge of the Tre Kroner is to be followed until the highest of the turrets on Rosenborg palace is in one with Nyholm masting-crane, and then the course is N. by W. along the Revshalen, until Nicolai tower is in one with the Tre Kroner battery, which becomes the leading mark to the northward, between the Middel Ground and the Stubben. With clear weather, and coming from the northward, you may run to the mark, Gientofte church in one with the Tre Kroner battery by keeping half of Dragör Grove to the eastward of Maglebylille Grove, which mark leads clear of all dangers, and will of course likewise serve in coming from the southward. If bound to Copenhagen, this mark ceases to be the leading one when the house of Rolighed is in one with the northern edge of the old lime-kiln.

Revshalen Shoal.

393. If the wind be scant, so that it becomes necessary to work to windward, mind to tack off Revshalen, on the western

side of the Konge Deep, when abreast of the Tre Kroner, till you come abreast of Sextus battery, which will be known by its flag-staff, (or till the royal palace of Christiansborg, the predominant building of the city, is to the southward of Nyholm crane,) as soon as Dragör Pillars approach the western edge of Kastrup lime-work, or before the powder magazine, P. M. No. 4, (immediately to the southward of Kastrup,) comes in one with the middle of Kastrup pier. From off Sextus battery till abreast of Prövesteen, the pillars are to be kept open to the eastward of Kastrup works, and the powder magazine, P. M. No. 4, open to the eastward of Kastrup pier-head. To clear Sundby-hage, which is steep-to, (and of which you are abreast when the south-east mill on the ramparts, near the gate leading to Amager is in one with the palace of Frederiksberg, standing on a hill to the westward of the city,) keep the villa Kildevæld, which stands immediately to the southward of Svane Mill, in one with the east point of Lunetten; and the western side of Dragör Grove nearly in one with the southern hill. This last mark is only applicable until Erelser church steeple is in one with the powder-magazine, P.M. No. 1 (close to Stricker battery); when farther to the southward, the grove is to be kept more to the eastward of the southern hill; and when off the Svalerumpen (another steep shallow which xtends from the Amager shore, and of which you are abreast when Taarnby church is a little to the southward of Kastrup rove) do not stand nearer to the shore than to bring Holænderby church a little to the eastward of Maglebylille Grove. When this last-named church is in one with the northern hill, he shallow is passed.

Svalerumpen Shoal.

394. Coming from the northward, the Middel Ground may be approached until Frederik church is in one with Christiansholm crane. When the palace of Christiansborg is close to the southward of Nyholm crane you are abreast of the western extremity of the shoal; and from thence towards its south-west point the mark is the Ermitage to the westward of the inn in Skovshoved. And thence to the south end of the Middel Ground attend to the two floating-beacons and the buoy, No. III.; but if these marks should be removed, keep Gientofte church in one with the villa of Mariendal (a remarkable white house with 12 corners on the road along the beach). The mark to pass to the southward of the Middel Ground is a small turret on Trinity

Middel Ground.

church (at the end opposite to the round tower) in one with Christiansholm crane.

Hollænder Deep.

395. The Hollænder Deep, as before-mentioned, is the shortest and straightest channel from the northward to the Drogden, between Saltholm Ground and the Middel Ground. The depth in this channel is 7 to 9½ fathoms, and 6 or 7 cables' lengths across, except at a short distance to the southward of the Middel buoy, No. IV., where an insulated shoal, the Ruggen, on the eastern side of the channel, narrows it to 5 cables' lengths, or half a mile.

Ruggen Shoal.

This Ruggen is separated from Saltholm Ground by a channel of only 1⅓ cables in breadth, but with 6 to 7 fathoms in depth. It is more than 6 cables in length from N. to S., and 1½ cables broad, and on its shoalest part there are only 14 feet hard bottom, with weeds; while close to the depth is 7 fathoms, so that it cannot be approached by the lead. Off the north end of the Ruggen, the highest spire of Rosenborg is in one with a small turret on the watch-house in the navy-yard at Nyholm, and at its south end Nicolai tower is just open to the northward of Christiansholm crane.

Wrecks in Hollænder Deep.

396. Four cables' lengths N.N.E. from Buoy No. V., lies the wreck of a line-of-battle ship, the Indfödsretten, and marked by a green buoy; the least depth on the wreck is 20 feet, with 10 fathoms all round. In the Hollænder Deep there is also a wreck of a gun *prame* with its green buoy on the following marks; Maglebylille mill in one with the eastern side of Kastrup, and a mill in Rabes-garden at the southernmost extremity of the city, so near Frelser church as just to see one of the mill-wings to the southward of it. But neither buoys nor floating beacons give sufficient warning off the edge of the Saltholm Ground, as the water suddenly shoals there from 6½ to 3½ fathoms; but the whole flat may be passed to the northward by keeping the cathedral tower to the northward of Nyholm crane; and the flat may even be crossed without having less than 3 fathoms by keeping Trinity round tower just open to the southward of Nyholm crane. Some distance within the edge of the shoal lies the wreck of the Mars, line-of-battle ship, in 15 feet water.

Saltholm Ground.

Hollænder Deep Marks.

397. The leading mark through the Hollænder Deep is, to keep Dragör Pillars in the middle of the open space between the village of Dragör and a high house named the School, which mark may be used the whole distance to Kastrup buoy,

No. II., in the Drogden. In working to windward in this channel, the eastern pillar may be run to the village of Dragör when standing towards the Middel Ground; and likewise the western pillar towards the school when standing towards the eastern side of the channel, though not while abreast of the Ruggen, for when within the marks of this shoal a small opening is to be left between the western pillar and the school.

If, owing to thick hazy weather, Dragör cannot be discerned, the Hollænder Deep may be passed by keeping Hollænderby church in one with the white beacon on the North Höi. This mark leads more obliquely through the channel, but clears the Ruggen, which is left to port, and the southern buoy, No. III., to starboard, and leads across the Svælget towards the shallow off the island Amager, just to the southward of the Svalerumpen.

Drogden Channel.

The Konge Deep and the Hollænder Deep unite in the Drogden Channel, which is more than 7 miles in length, and passes between the shallows off Amager and Saltholm into the Baltic; but before giving directions for that important channel, it will be proper to describe the shallows and shoals between which it passes.

398. The bank along the Amager shore from the Sundby-hage to the shoal called the North Röse, being a distance of 2½ miles, extends a mile from the beach, but decreases off Dragör to less than half that breadth; there it again increases, so that towards the extremity of the sand-tail its 4 fathoms edge is 1¼ miles from the shore. In the northernmost part of the Drogden, just at the entrance to the Konge Deep, there is a narrow ledge of sand skirting the bank and carrying only 12 feet: the northern extremity of this ledge is called the Sundby-hage, and its southern point the Svalerumpen, and both of them are marked by floating beacons.*

Sundby-hage Svalerumpen.

399. Fully a mile to the southward of the Svalerumpen there is a shoal with 12 feet water, just on the edge of the bank, and a mile from the pier-head or Kastrup lime-kilns. The north end of this shallow is called the Kastrup Knæ, and is marked by the buoy No. II., and its south end, which is rocky and steep from 5 to 2 fathoms, is called the North Röse, signifying a heap of rocks. It is is marked by a floating beacon in 20 feet water.* When

Kastrup Knæ.

North Röse.

* See note to Article 388.

abreast of Kastrup Knæ, Taarnby church is in one with the southern part of Kastrup village; and when abreast of the North Röse, the northernmost tree in Taarnby village is in one with the southern part of the village Kastrup. To pass close to the eastward of the Knæ, in 5 fathoms, keep Gientofte church open east of Lunetten; and the North Röse is passed in 5¼ fathoms by keeping the same church just in one with the eastern edge of Lunetten, or Dragör Pillars in one with the western edge of Höierup, which is the westernmost house of that cluster of buildings of which the school is the easternmost.

Being to the northward of Kastrup Knæ, when Kastrup mill is seen midway between Kastrup Grove and the powder magazine, P.M. No. 3, and when the pillars are in one with the western part of Dragör village, there will be 3 fathoms water, and for vessels not drawing more than 12 feet, good anchorage, on a clayish bottom. And about 5 or 6 cables' lengths off shore there is a ridge with only 6 feet water, inside of which small craft will find good anchorage.

Kastrup Lime Works. The buildings of Kastrup lime-works are high and conspicuous, and during the night the fires in the lime-kilns may sometimes be seen. A pier has been erected there for the convenience of loading and unloading, and within this pier there is a harbour for small craft.

Maglebylille Hage. 400. Half-way between Kastrup and Dragör lies Maglebylille Hage, a shoal not passable, even for large row-boats; and outside of it there are two rocks, marked by brooms on poles fixed in the ground. When abreast of this shallow, a *remise* or grove, named Jordborg, is in one with the northern part of the village of Maglebylille, and it is passed close to the eastward by keeping the cathedral tower in one with the stable at Kastrup.

Ravneungerne. 401. Farther southward, towards Dragör, the foul edge of the shallow along the shore is named the Ravneungerne, and inside there are some large rocks, of which the Ravnen and the Rödsten are visible at low water, which is not the case with another stone named the Rasmus. The edge of the deep-water channel is there marked by a floating beacon; and when abreast of this beacon, Taarnby church is in one with the southern part

---

* The new edition of the Danske Lod says, that this beacon is to remain out during the winter in future. P. 441.

of the village Maglebylille. No vessel should approach nearer to the shore than Nyholm crane being well open east of Kastrup pier-head. Abreast of the Ravnen, and on the wreck of a brig, there are two poles, one carrying a broom turned upwards, and the other a barrel.

Abreast of Dragör, when Hollænderby church is in one with the middle of that village, the shallow along the beach becomes narrower, and the depth of 4 fathoms will be found when Frelser church is apparently just outside of Maglebylille Grove.

At the village of Dragör a harbour has been constructed of pilework, but at present it has only 5 feet water. The rocks on the edge of the inlet to the harbour are marked by poles carrying flags. Dragör is a pilot station, and has a custom-house and a quarantine office. *Dragör*

402. Distant 1½ miles south of Dragör lies the South Röse, a rocky ledge with only 12 feet water, and steep-to from 4 fathoms; it is extremely dangerous, and is accordingly marked by a floating beacon, which is kept standing during all seasons of the year, whereas most of the other beacons are removed during the winter.* This beacon is placed in 25 feet water, and may be cleared to the eastward by keeping the whole of Kastrup works outside of Dragör pierhead. *South Röse.*

403. South-west from the floating beacon on the South Röse, distant 6 cables' lengths, lies the Dragör buoy No. I., in 18 feet; and in the same direction, distant 1⅝ miles, on the extremity of the sand-tail reef, there is a floating beacon in 22 feet water, which serves to point out the entrance of the Drogden from the southward.* *Dragör Buoy and Sandreef Beacon.*

404. On the eastern side of the Drogden the shallow of Saltholm extends south and south-west nearly 2½ miles before the depth of 4 fathoms is obtained; but 21 and 22 feet may be found a considerable distance inside of that line. In three places, however, on that very edge, and therefore close to the deep-water channel, there is only a depth of 2 fathoms, with foul, rocky bottom. These three shoals are called the Holmetunge, the Kraase bank, and the Smaa Ground. *East side of the Drogden. Saltholm Flat.*

---

* See Note to Article 388.

Holmetunge. 405. The Holmetunge is the south-western extremity of the Saltholm flat, and thus forms the south-eastern extremity of the Drogden channel. This very dangerous shoal lies 1¼ miles from Saltholm, and great attention to avoid it is necessary, as the current from the southward sets directly across it. Its west side is marked by a floating beacon with two brooms, which is tied downwards, and which is left out during all seasons of the year.* When abreast of this beacon, Hollænderby church is in one with the southern side of Dragör village; and when on this mark do not stand nearer towards the shoal than till Frelser church steeple comes in one with the west side of the powder magazine, P. M. No. 4, to the southward of Kastrup.

Kraase Bank. 406. The Kraase bank is not quite a mile to the northward of the former, but 1½ miles from the south-west point of Saltholm. When abreast of it Hollænderby mill is just to the northward of Dragör Pillars, and to pass to the westward of it keep the tower of the cathedral inside of Kastrup works, or the steeple of Frelser church in one with the eastern side of those works.

Smaa Ground. 407. The Smaa Ground lies in the northern part of the Drogden, abreast of the Svalerumpen, fully 3 miles from the Kraase bank, and more than 1½ miles from Saltholm. While Taarnby church is in one with some houses, named the Smaahusene, in the vicinity of Kastrup, this shoal will be passed to the westward by keeping the pillars to the eastward of the house at Höierup; but when the church is to the northward of the Smaahusene, the pillars should be in one with Höierup. The shoal is not marked by any beacon; but 6 cables' lengths further north, on the edge of the same shallow, there is a floating beacon on the wreck of the Kronborg frigate, to the southward of which there are 6 fathoms, to the northward 5 fathoms, and on the wreck itself 22 feet.

Knoll. 408. Besides these shoals on the Saltholm shallow, which forms the eastern side of the Drogden channel, there is an insulated reef called the Knoll, in deep water. The 4-fathom boundary of this knoll is more than 2 cables' lengths across, and is separated from the Saltholm shallow by a deep channel; but being less than 3 cables' lengths wide, the most common track is to the westward of the Knoll. The soundings on it are spotted with

* See note to Article 388.

white, and in the shallowest spot there are only 14 feet water. The mark for its south end is, Taarnby church in one with the North Höi; and for the north end, when the southernmost tree is in one with the same hill. It is passed to the westward by keeping Frelser church steeple in one with Nicolai watch-tower, and a small opening, just large enough to be visible, between Dragör village and the school.

409. Finally, in the southern mouth of the Drogden channel, and 2 miles outside of the Holmetunge, the Quartus Flat occupies a space of 1½ cables' lengths each way within the 4-fathoms line; but it is well marked by the Dragör light-vessel. The shallowest spot is on its S. by E. side, where the depth is 19 feet, and one cable's length, N.W. by N. from thence, the light-vessel, as described in Article 388, has been placed. During her absence, the mark to pass close to the S.W. of the shoal is, to keep the church of Hollænderby in one with the northern edge of Nye Grove; the mill of Hollænderby in one with the western edge of Nye Grove clears it to the N.E.; Frelser steeple, well open west of Dragör Pillars, leads to the westward, and the royal palace of Christiansborg, a little open to the westward of the village of Dragör, clears the flat to the eastward. *Quartus Shoal.* *Floating Light.*

410. In the space between Dragör and the Quartus Flat there are numerous shallows, having only from 21 to 22 feet water; so that this passage into the Drogden can be taken only by the small-class line-of-battle ships, and by them with much caution; for those shallow places rise irregularly, 3 or 4 feet above the surrounding ground, being all heaps of hard gravel. Large ships are therefore taken to the eastward of the Quartus; and in so doing they have to guard against the current, which, if running to the northward, begins there to slant to the N.E. into the Flint Channel. As a principal leading mark, keep Nyholm crane in one with the eastern side of the highest house in Kastrup works; and on this mark the depth will be 4 fathoms or more until Hollænderby church is half-way between Dragör village and Dragör Grove. Then change the course more to the northward, so as to bring Frelser church steeple in one with the middle of Kastrup village, and at the same time Hollænderby church in one with the middle of Dragör village. You will then be past the Dragör Bridge, the name given to these shallows, which form the foulest part of the whole channel; and in pro- *Dragör Bridge.*

ceeding to the northward the depth will soon increase. Yet just to the southward of a line drawn from the north of Dragör harbour to the Kraase bank, and in the mid-channel, there is a solitary rock called the Independence, surrounded by 4½ fathoms, and carrying only 21¾ feet, with a common water-stand. The marks for it are, Frelser church steeple just open north of the powder magazine, P.M. No. 4, and Hollænderby church in one with the eastern side of a hedge close to Dragör Pillars.

Independence Rock.

Having thus given marks for all the shoals and shallows in the Drogden, as well as the leading marks for its most difficult parts, it would be superfluous to enter further into any minute directions for the navigation of what must be considered pilot-water; the more so as, during the greatest part of the year, it is provided with warning-buoys and guiding-beacons.

Bred Ground. 411. Immediately to the southward of the Drogden and Flint Channels there are two large shoals, called the Bred Ground and the Lille Ground; the former of which is connected by a flat to the Swedish shore, and the latter entirely detached, and might be circumnavigated by ships of any size.

Lille Ground. The Lille Ground is of considerable extent, and very uneven depth; and is encumbered with several patches of rocks, some of them being very shallow. A narrow 3-fathoms channel divides it into two parts, the southernmost of which has only 6 or 7 feet on some spots, whereas the least depth on the northernmost part is from 9 to 11 feet; but no vessel should borrow on this shoal nearer than 4½ fathoms. In approaching its northern part from the westward, Frelser church may be brought as far as the middle of Dragör village; whereas, in standing towards its S.W. end, the church must not come to the westward of midway between Dragör village and Dragör grove. Off its N.W. end, as before mentioned, there is a floating beacon, with a downward turned broom, like all the rest of the floating beacons on the eastern side of the channel. The Drogden light-vessel bears N.W. by W. ½ W., distant 1¾ miles from this beacon, and lies in 4½ fathoms; serving therefore as a good guide to vessels going into the Flint Channel. The marks for the position of the beacon are, the principal church of Malmö in one with Limhamn beacon (a pole carrying a square board), and the steeple of Frederik church, in Copenhagen, in one with the Dragör eastern-most pillar.

In February, 1850, the Vulcan, merchant barque, sank in 7 fathoms about 6 miles from Falsterbo lighthouse; with the S.E. point of Cape Stevns S.W. by W. ½ W. The masts and bowsprit were taken out, and the wreck blown up; the least depth on it at present is 27 to 28 feet. And on the following month, a vessel sank 1½ miles from Dragör light-vessel; with the light-vessel north, and Dragör Grove N. by W. ½ W.; when the mast was taken out the least water on the wreck was 25 feet, but it is said her remains have recently disappeared. *Wrecks.*

Before proceeding further, we shall describe the Flint Channel, which leads to the eastward of Saltholm, and which is much less frequented than the Drogden.

CHAPTER VI.

THE FLINT CHANNEL.

Saltholm, East Side.

412. THE eastern side of Saltholm is surrounded by shallows, extending yet farther out than those on the opposite side. Towards the N.E. the edge of the 4 fathoms depth is 2 miles off the beach, and from thence the water gradually shoalens; but on the eastern and south-eastern sides that depth is only a mile off, and the bank is much steeper. A mile east of the island lie the Svanklapperne Cays, constantly visible above water, and covered with grass, and from them, all round the southern end of the island, the bank is full of rocky heads, some of which are above water, and some are covered.

Swedish Shore.

Lundåkra Bay.

Barsebak Reef.

Kullan Rocks.

Pinhätten Knoll.

413. Between the towns of Landskrona and Malmö the coast forms two bays, Lundåkra and Lomma; of which the former is the northernmost and smallest, and of little use to shipping. From the southern extremity of this bay, Barsebak Point, a reef extends W. by N. half a mile, and terminates in the Kullan Rocks, which show above water. In the direction of this reef, but 1½ miles from the land, and separated from the Kullan by a channel with 15 fathoms, there is a small flat called the Pinhätten, with 23 feet water.

Saltvik.

414. Between Barsebak and Viksteen Points there is a small bay, called Saltvik, where small craft, not drawing more than 10 feet may stop, with the wind off shore, but anchoring half a mile from the beach. Boats may run in to the southward of the rock called Skarören.

Lomma Bay.

415. To the southward of Viksteen Point comes Lomma Bay, on the southern shore of which stands the town of Malmö, with its extensive and safe road, sheltered by Saltholm and its surrounding banks. Along the beach of this bay the shallows are very wide, the 4 fathoms line being from 1 to 2 miles off the shore, and the water gradually shoaling towards the beach. The deepest water, 9½ fathoms, is to be found close to the east side of the

Siöllen shoal, where the bottom is bluish clay. The only shoal on the eastern bank along the beach is the Fladje-reef; it lies in the northern part of the bay, abreast of the Löddekaret river, and is a mile from the beach, having 2 fathoms all round, but only 3 feet on its shoalest part. *Fladje-reef.*

416. To the eastward of the shallows off Saltholm there are four detached shoals and a flat; of these shoals the Biörnen lies to the N.W.; the North Flint to the S.W.; the Gustaf Klint N.E.; and, finally, the Siöllen lying to the eastward of all.

The Biörnen is 2½ miles from Saltholm, about half a mile in length, and on its shallowest part there are 8½ feet water, rising steeply from a depth of 6 fathoms. *Biörnen.*

417. The North Flint is a narrow shelf, the shallow part extending 3 cables' lengths, in the middle of which there is a large rock 2 to 3 feet above water. Both sides of the shoal are steep-to from 5 fathoms, but its north and south ends are sloping, and the whole extent in that depth is about a mile. *North Flint.*

418. The Gustaf Klint is an extensive irregular flat, with a rocky spot, on which there are only 13 feet water: the mark for this spot is, Dagstorp church in one with Saltvik mansion (Planter-hus); and therefore, to avoid it the church is to be kept open on one or the other side of that house. *Gustaf Klint.*

A small flat, carrying 19 or 20 feet, lies to the southward of the Gustaf Klint, but is separated from it by a narrow channel with deep water.

419. The easternmost and largest shoal in the bay is the Siöllen; its length being E.N.E. and W.S.W. 2 miles, but only half a mile across. It is mostly rocky, with 13 feet water, except towards its south-western extremity, where there is an 8 feet spot. Off its N.E. shoulder, and 3½ miles N.W. from Malmö, a black buoy is placed in 17 feet water. *Siöllen.*

420. As a general mark to clear all these shoals to the northward, keep Copenhagen steeples to the northward of the Barrack on Saltholm; or, keep Lund church (on the Swedish shore) to the northward of Lomma church. To pass to the southward of them all, keep the easternmost mill of Malmö in one with the lighthouse on the harbour mole; and to pass to the eastward of them, keep Limhamn beacon in one with the eastern edge of Annatorp wood; or Fosie church in one with the mill to the westward of Malmö castle. These marks will lead

outside the shoals, but between them there are passages with a depth of 6 or 7 fathoms; for instance, Bunkeflo church, in one with Limhamn beacon crosses the S.W. end of the Siöllen in 3½ fathoms, as well as the N.E. end of the Biörnen in nearly 3 fathoms, and clear of all other dangers; so that vessels of any size may go through this channel, by keeping the church somewhat open to the southward of the beacon when passing the Siöllen, and somewhat to the eastward of the beacon when passing the Biörnen. The North Flint may be passed to the eastward by keeping Dagstorp church in one with Planter-hus; and to clear it to the south-westward, keep Hyllie church well open to the southward of Limhamn beacon.

Malmö Road. 421. Malmö Road offers good anchorage everywhere; but by keeping Fosie church, which has the loftiest of all the southern steeples, between the two churches of Malmö, and by bringing Upåkra church (which stands on high ground) to bear E. ½ S., or in one with the southernmost trees of Alnarpa wood (the largest grove in the neighbourhood), there will be found 7 fathoms water at 2 miles from the shore. Within a mile of the town the depth is 3 fathoms.

Malmö Harbour. 422. Malmö Harbour is formed by two parallel moles extending to the northward 685 yards from the beach; between these moles the entrance is 58 yards wide. The harbour is to be dredged out, so as to admit vessels drawing 14 feet; and on the *Malmö Light.* western pier-head there is placed an excellent harbour-light, elevated 48 feet, and affording a good guide to the harbour or to the anchorage in the road.

Pilots. Pilots are stationed at Malmö.

Flint Channel. 423. The Flinterende, or Flint Channel, leads from Malmö road to the southward, and may be called the second of the principal entrances into the Baltic; and yet it is rarely frequented by any other vessels than those belonging to Malmö.

The whole of the Swedish shore from Malmö to Falsterbo is low, and has in very few places water sufficient for boats to approach the beach. The first 2 or 3 miles of the shore from Malmö trends to the westward, and at the limekiln of Limhamn, or the southern extremity of the extensive Bay of Lomma or Malmö, the Flint Channel may be said to commence.

Limhamn. 424. At Limhamn there is a pier, at the head of which 11½ feet water will be found; and in the vicinity a beacon-pole stands

38 feet high, and 74 feet above the sea, carrying a white square board, facing the Lille Ground. The shallow here extends only 3¼ cables' lengths from the beach; but it widens to the southward until abreast of the Bred Ground, where, including that shoal, its outer edge is 6 miles from the beach, and from thence it again narrows to Skanör and Falsterbo.

425. S.W., distant 2 miles from Limhamn, the Lernacken Reef projects 1½ miles from the beach, with only 13 feet water; and nearer the shore the Skälör Rock rises above the water, with many other rocks round it. *Lernacken Reef.* *Skälör Rock.*

426. On the edge of the shallow, half a mile to the northward of the Lernacken, and 1½ miles from the beach, lies the Trindel, a narrow shoal, a mile in length, with 11 feet on its shoalest part;* and a third of a mile west from the south end of the Trindel there is a very dangerous little rock named the Rothe, with 9 feet only; whereas between it and the Trindel there are 3 fathoms. These shoals, and the South Flint on the western side, form the narrows of the Flint Channel. To pass to the westward of the Trindel and Rothe, a large whitish hill east of Malmö is to be kept to the northward of a low house covered with red tiles, standing on the pier of Malmö harbour; and Hollænderby church kept either to the northward or to the southward of Dragör village leads north or south of those shoals. *Trindel and* *Rothe.* *Flint Channel.*

427. Just in the middle of the northern mouth of the Flint Channel there is a limestone rock called the Kalk Ground, about 4 cables' lengths long, and 2 across; it carries but 10 feet water, with much seaweed on the shoalest part, and on the north and west sides steep-to from 5 fathoms. A floating beacon, showing a red flag, is placed on its S.E. side, about 200 feet from the shallowest spot, and distant nearly 3½ miles W.N.W. from Malmö. Hyllie church kept well open to the southward of Limhamn beacon leads clear to the south-westward of this shoal, and Bunkeflo church in one with the same beacon is the mark to pass to the north-eastward of it. On both sides of the Kalk Ground there is open water with from 4 to 7 fathoms, on a bottom of rock and sea-weed. *Kalk Ground* *Beacon.*

428. The shallow flat that surrounds Saltholm includes the Svanklapperne Cays, and then suddenly projects a mile into the Flint Channel, but carries there from 3 to 3½ fathoms. Its south- *Svanklapperne Cays.*

* According to the Swedish Directions, the depth of water on the Trindel varies from 7 to 13 feet.

ern extremity is 2 miles from the dry rocks off the south point of Saltholm, and in the middle of this part of the flat lies the South

South Flint. Flint, a narrow, curved, and dry ridge of sand extending east and west about 200 feet; near the middle of it there is a rocky knob, the top of which, with a common water-stand, uncovers 7 or 8 feet. It lies in the line of Hollænderby church in one with Dragör pillars.

A narrow flat extends a mile towards the S.W. and 4 cables' lengths towards the N.E. from this dry rock, with less than 3 fathoms, and all foul ground. To pass to the southward of this shoal in 3 fathoms water, keep Hollænderby church in one with the middle of Dragör village. The channel between the South Flint and Saltholm is half a mile across, and has in general 3 fathoms water, except at its southern end, where some rocks are found with only 13 or 14 feet. On both sides of this intricate channel the water suddenly shoalens to 7 or 8 feet.

Flint Channel. 429. The whole breadth of the Flint Channel, between the South Flint and the Trindel and Rothe rocks, is only 2 miles, between the depths of 3 fathoms on either side; and in the mid-

Steen Ground. channel lies the Steen Ground, a ridge of sand and rock with

Beacon. 18 to 20 feet water. On its N.W. side there is a floating beacon, with a broom turned upwards, in 21 feet water;* and between this ridge and the South Flint, and close to the former there is a deep-water channel; but it is only 3 to 4 cables' lengths across, with an uneven depth from 4 to 6 fathoms, a foul bottom, and several small rocky heads scattered here and there, on which the depth is only 22 or 23 feet. The greatest depth of which one can be sure in the Flint Channel is 22 feet; and therefore it should be attempted only by vessels not drawing more than 18 to 19 feet.

This narrow and intricate part of the channel commences, when coming from the northward, as soon as Fosie church is in one with Limhamn beacon, and Hollænderby church with Dragör pillars, or with the South Flint; and its difficulties continue for a distance of 1¼ miles, until Hollænderby church comes to the southward of Dragör village. The shoals are all then passed, and proceeding from thence to the southward you will not have less than 4 fathoms.

Thus the natural bars, on which depends the passage of large

* According to the Swedish Directions, the beacon carries a black flag.

ships through both the Drogden and Flint channels, are very much alike. Formerly, it was the common opinion that the Flint was the deepest of the two; and if all the rocks lying in the fair track were removed, it would indeed have a foot more water than the Drogden; whereas, as matters now stand, it has actually a foot less, because its rocky heads are more numerous, and larger. Owing to the few vessels that frequent this channel, great skill is not to be expected from the Swedish pilots; and the less, as the actual state of the Flint Channel has been only lately ascertained by a careful survey made by order of the Danish Government. Good leading-marks for the passages through the Flint are not to be expected, and, until the channel is more distinctly defined by buoys and floating beacons, the navigation of it will be very difficult for large ships. Another inconvenience, and it applies to all classes of vessels, is, that the bottom throughout the channel, to the southward of the Kalk Ground, is rocky, so as to make it questionable whether the anchor would take hold, if, owing to calms or currents, it was found necessary to let it go.

Western Flint Channel, from the Northward.

Large ships ought not therefore to attempt the Flint Channel unless with a fair leading breeze: with a sufficient berth off Barsebak Point, they will go outside the Pinhätten; though, if more convenient, they may pass within 2 cables' lengths of the Kullan Rocks, which can be seen. From thence they must steer south, a little easterly, so as to bring the steeples in Malmö to bear S.S.E. before any part of Copenhagen either bears W. by N., or comes in one with the barrack on Saltholm; and before Lomma church comes to the southward of Lund cathedral. When Fosie church is in one with a mill close to the westward of Malmö castle, or when Limhamn beacon touches the eastern edge of Annatorp wood, you may steer on this latter mark till past the buoy on the east side of the Siollen, and then the course is to be suddenly changed to W.S.W. or S.W. by W., steering for the flag beacon, on the S.E. side of the Kalk Ground, and distant from the above buoy 2 short miles. You will then have dropped from 9 fathoms bluish clay into 5 fathoms foul ground, and may pass this shoal on either side, according to circumstances; but observe that in passing it to the northward, you may not approach the flag beacon nearer than 3 or 4 cables' lengths; whereas to the southward of the shoal (which, owing to the prevalent current from the southward, is in most

cases the safest passage), the beacon need e left only one cable's length on the starboard or northern side. Past this beacon, or when Hyllie church becomes visible to the southward of Limhamn beacon, the course is to be W. ¼ S. in 4½ to 5 fathoms, rocks and seaweed, so as to bring Fosie church in one with Limhamn beacon at the same moment that Hollænderby church comes in one with Dragör pillars and the South Flint. You are just then entering the narrowest part of the channel, and must steer W.S.W., leaving the floating beacon on the Steen Ground a short distance on the port or eastern side. When Hollænderby church comes in one with the southern part of Dragör village, the course may be shaped so as to pass a mile to the southward of the Dragör light vessel, stationed at the Quartus Flat, or more or less, according to the direction and the velocity of the current. This course will lead you out between the shallows off Saltholm and the

Lille Ground Beacon. Lille Ground, on the N.W. side of which there is a floating beacon, as before mentioned. The marks to clear the Lille Ground are, the highest steeple at Malmö in one with Limhamn beacon, and the remarkable tree, called Peter Timan's tree, in Holænderby village, in one with the northern edge of Dragör Grove.

Western Flint Channel, from the Southward. 430. When coming from the southward, and intending to take the Flint Channel, by steering E.N.E. to the northward of the Lille Ground beacon, mind to bring the South Flint to bear N.E. by N., or the beacon on the Steen Ground to bear E.N.E. before Hollænderby church comes in one with the southern part of Dragör village, and then steer in such a manner as to keep the beacon on the Steen Ground one or at most two, cables' lengths on the starboard side. When Hollænderby church is brought in one with Dragör pillars and with the South Flint, or when Fosie church is seen to the northward of Limhamn beacon, the narrows are passed, and then, conversely following the directions given above, the vessel may pass on either side of the Kalk Ground.

Knösen Shoals. 431. To the northward of Skanör peninsula there are numerous shoals, standing on a large surrounding flat; but leaving channels between them. A reef projects 1½ miles from Knösen Point

West Haken and Tolken. called the West Haken, and is separated from another shoal, the Tolken (on either of which there are but 10 feet), by a narrow channel with a depth of 2½ fathoms. The Tolken is again

Ko Ground. separated by a channel with 3 to 4 fathoms from the Ko Ground, on which the depth is variable, the last survey showing 8 feet; but it is reported, that on some of the rocks it does not exceed 5

feet. The Ko Ground is separated from the Bred Ground by a navigable channel, with 3 or 4 fathoms water, and 3 or 4 cables' lengths wide.*

Bred Ground.

432. The extensive and dangerous shoal, called the Bred Ground, is surrounded by deep water, and is more than 3 miles long N.N.E. and S.S.W., and fully 2 miles across. On several parts of it there are rocks, with only 4 to 5 feet; and along its eastern side there are two narrow shelves of sand, the whitish colour of which distinctly mark its edge. The western side, on the contrary, has a gradual slope; and there it may be approached by soundings. A floating beacon, with a ball upon a pole, painted alternately black and white, is placed off the N.W. side of this shoal, in 5½ fathoms water: the marks for this beacon are, the highest steeple of Malmö in one with the northern edge of Annatorp wood, and the steeple of Frederik church in Copenhagen in one with the western border of Dragör Grove. This beacon lies exactly in the mouth of the channel, between the Lille Ground and the Bred Ground. The steeple of Frelser church, in Copenhagen, kept close to the western edge of Dragör Grove, leads close to the westward of the Bred Ground; and if that steeple is kept in one with Nye Grove, you will pass two-thirds of a mile to the westward of this shoal. Likewise, Dragör pillars in one with the middle of Dragör village leads sufficiently to the westward of it; and the hummock on Knösen Point in one with Räng church marks the southern shoal extremity of this extensive bank.

Beacon.

Channel across the Lille Ground.

433. If a vessel should be obliged by mistake, or any other cause, to pass through the narrow channel across the Lille Ground, which, though 3 fathoms deep, is only a couple of cables' lengths across, it may be done by keeping Tygelsjö church in one with a remarkable declivity on the interior land, which leads exactly through the channel; and when in the narrowest part of this channel, Frederik church in Copenhagen will be in one with the westernmost of Dragör pillars.

Mark.

Channel between Lille and Bred Grounds.

434. A safer channel, with depth of water for vessels of any size, is that between the Bred Ground and the Lille Ground; for although this channel, for a very short distance in its narrowest part, is only 3 cables' lengths across, it has everywhere 4

* It would appear, from a recently published Swedish chart, that a beacon has been placed on the western side of the Ko Ground.

Mark. to 5½ fathoms water. The mark to pass it is, the highest steeple of Malmö nearly in one with the middle of Annatorp Park-wood, or, more precisely, halfway between the north end of the wood and two large granges covered with tiles, near the south end of the wood;* the least depth on this mark will be 4½ fathoms, and the same depth will be found generally inside the Lille Ground, between it and the shallow along the shore, though in a few spots there are only 20 feet. When the cathedral in Copenhagen is open E. of Dragör pillars, you may steer between N.N.E. ½ E. and N.E. by E., along the shallow off the shore. Here the holding-ground is good. Vessels of moderate size may even be able to work to windward through this channel; and by paying attention to the following directions, they will have not less than 3 fathoms. While in the western part of the channel, or as long as the cathedral is to the westward of Dragör pillars, keep the highest steeple of Malmö not more northerly than just well open to the northward of Annatorp Park-wood, and not more southerly than near the granges at the southern end of the wood; and, secondly, when the cathedral is to the eastward of Dragör pillars, you must tack whenever Malmö church comes in one with either the north or the south ends of the above wood.

435. The following description of this part of the coast is taken from the Swedish Sailing Directions.

Channel inside of Lille and Bred Grounds. The bank along the shore from Lernacken to the point of Nässet, on the eastern side of Höle Bay, is very shallow, and extends about 1½ miles from the beach; but the channel between the bank and the outer shoals is 2 miles across, with a decreasing depth of water from 5 to 2½ fathoms, but irregular, and the bottom varying between clay, *sleek*, and sand, and affording anchorage to vessels not drawing more than 12 to 14 feet water. Such vessels may stand out to sea through the channel between the Bred Ground and the Ko Ground; for though a more exact knowledge of this channel is wanted, it may probably be passed by keeping Limhamn beacon exactly N.E. ½ E.

Höle Bay. In Höle Bay there are 2½ fathoms water, and it forms an excellent roadstead for vessels drawing 10 to 12 feet, two-thirds of a mile from the shore.

Beacon. On the ridge of Nässet Point there is a beacon in the vicinity of the village of Lille Hammer, which, like that at Limhamn,

* View 22.

is a pole carrying a large square; and it serves as a mark for all the navigation inside the shoals. To pass N.E. of the Tolken and Ko Ground, this beacon may be kept open to the northward of Räng church. The mark for the narrow channel between these two shoals is, to keep Malmö highest steeple a little open to the eastward of Hyllie windmill.

436. From the West Haken Reef to Falsterbo Point the western shore of the Skanör Peninsula is entirely clear, and may be approached by soundings; 3 quarters of a mile off shore there are from 4 to 5 fathoms, sand and clay, with good shelter against easterly and southerly winds; and, accordingly, a good anchorage for vessels bound to the Baltic, in case of unsettled weather and contrary winds. In the village of Skanör pilots may be had for the Flint Channel. *Skanör Peninsula.* *Pilots.*

437. About two-thirds of a mile from the low, sandy point of Falsterbo, and W. ½ S. from the church, the lighthouse of Falsterbo stands 68 feet high: it was the first light erected in these northern countries, and dates from the year 1202, during the reign of King Waldemar II.: at present it is a Fixed light of the second order, elevated 78 feet above the level of the sea, and thus may be seen 13 to 14 miles. This important light, in conjunction with the revolving light on Cape Stevns, serves to guide navigators in making the Sound from the southward, and is of especial utility in avoiding the extensive and dangerous reef of Falsterbo. *Falsterbo Light.*

438. Falsterbo Reef is flat, and extends about 5 miles from Falsterbo Point, in the direction of S.W. and W.S.W., with many rocks on which there are only 8, 10, or 14 feet water, but with 3 to 4 fathoms between them. The bottom is generally rock, but 1½ miles S.S.W. of the point there is a dry sandy cay called the Måklapp. *Falsterbo Reef.*

439. Falsterbo Reef is particularly dangerous to vessels coming from the southward, and a light-vessel has therefore been placed off its southern extremity. This floating Light is very conspicuous; it is stationed half a mile outside the 3 fathoms edge of Falsterbo Reef, in 5 fathoms water, Stevns light bearing W.N.W ½ W. 11½ miles, and Falsterbo shore-light N.N.E. ½ E. 5½ miles.* The vessel has two masts; the foremast, the *Falsterbo floating Light.*

* A floating beacon was formerly placed in nearly the above position; and the light-vessel lay 2½ miles farther to the westward.

highest, carries a red vane on the top. On each mast there is a light elevated about 50 feet, but that on the foremast is somewhat higher than the other. The vessel is painted red, and on both sides are the letters F.S. in white. During foggy or thick weather a large bell is tolled. The vessel serves also as a station for five pilots, for either the Flint or Drogden channels; and while any pilots are on board the pilot jack is kept flying.

Pilots.

When the Falsterbo floating Light is not in her station, Stevns light should not be brought to bear to the westward of W.N.W. and during the day the north point of Cape Stevns should not be allowed to come to the westward of N.W. by W. before Falsterbo light bears N.E. You may then steer north until Skanör church bears E.N.E., or Stevns light W. ½ S., for then the reef will be passed. When just off the point of the reef, the churches of Falsterbo and Skanör are in one, but to be to the westward of the reef, Skanör church must be seen to the westward of Falsterbo lighthouse.

Entering the Sound at night.

440. For entering the Sound from the southward, we have already stated all the different marks, which, during the day in tolerably clear weather, will serve to avoid the shoals; and at night bearings of the light of Falsterbo, as well as of its floating light and of the Stevns and Dragör lights will be sufficient guides; for by referring to the Chart it is evident, that to pass to the westward of the Lille Ground and Bred Ground, the floating light of Dragör must not be brought to the westward of north, nor Falsterbo light to the southward of S. by E. In foggy or thick weather it is not advisable to stand in; but if obliged to do so, the soundings will afford much information, as follows.

Soundings.

441. In the outermost part of the Sound, between Falsterbo and Cape Stevns, the greatest depth midchannel is 13 fathoms, shoaling towards either side, and likewise gradually to the northward into 6 fathoms. Off Cape Stevns, at 2 to 3 miles from the shore, there are from 9 to 11 fathoms, with soundings of coarse sand and rock; and on the opposite side, along Falsterbo and the Bred Ground, the depth decreases more quickly, but still gradually, and the bottom is coarse sand, but the rocky spots are more numerous the nearer you are to the eastern side of the channel, as well as farther in, where the depth midchannel is 8 and 6

fathoms, with variable soundings. Towards the Lille Ground coarse sand and frequently rock prevail; whereas towards Kiöge Bay, as well as when in that bay, you will have fine sand on the lead.

THE EASTERN SHORES OF SIÆLLAND AND MÖEN.

442. Having given a minute account of the Sound, and how to make it when coming from the Baltic, we shall now describe the eastern shores of Siælland and Möen as far as Grön Sound, for the sake of all vessels desirous of entering the Sound from the south-westward. *Eastern shore of Siælland.*

443. The eastern shore of Siælland forms, in conjunction with the island of Amager, the extensive bay of Kiöge, and to the southward of the island of Möen the nearly equally extensive bay of Faxö; which two bays are separated by the high and bold promontory of Cape Stevns. *Kiöge Bay.*

Along the shore of Kiöge Bay the bank extends pretty far out; for in the northern part of the bay, off Amager, the 4 fathoms line of soundings is fully 2 miles from the beach. It is of less breadth along the next part of the shore of Siælland, but it soon widens in the interior part of the bay; so that the Kiöge Flat projects nearly 3 miles, and again narrows between Kiöge and Cape Stevns, where it seldom exceeds a mile from the beach. Off Mosede cliff, 7 miles to the northward of Kiöge, there is a rock with 5 feet water only, at the distance of 3 cables' lengths from the shore; and separated from that rock by an 8-feet channel, and at a cable's length outside of the white sand, there is another foul spot with 8 feet on it, and 11 to 12 feet all round. *Mosede Rock.*

444. The mark to pass outside of Kiöge Flat in 5 fathoms, is Magleby church, the only one with a spire, just open to the westward of Giörslöv Park. To pass it to the southward in 5 fathoms, look out for the third from the southward of a cluster of mills to the northward of Kiöge, and keep it in one with a remarkable cleft in the lower part of a wood west of those mills; and by bringing Herfölge church twice the length of a ship inside the western border of Billesborg wood, the south-east point of the flat is passed in 4 fathoms. The water gradually shallows towards the shore, so that it is approachable all over the bay by soundings. *Soundings.*

The bottom within the depth of 10 feet is generally white sand, and farther out dark, but still fine. In some places,

especially in the vicinity of Mosede cliff, as well as towards Kallebo Strand, or the large inlet with shallow water which leads up to Copenhagen, between Siælland and Amager, the bottom is rocky. Rocks are also found near the beach on the south side of the bay, within 2 miles to the westward of Sönakke Point; but throughout the rest of the bay the broad shallow bank is clean.

Juels Ground. 445. The only real danger in the bay is Juels Ground, on the shoalest part of which there are, however, 20 feet. This shoal consists of four separate patches, and they are steep-to, with gravel to the southward, and fine grey sand on the northern sides. Herfölge windmill in one with the north edge of Pramskoven wood leads to the southward of them in 4 fathoms; or Herfölge church in one with a remarkable gap between two woods to the northward of the mill, and the same mill kept near the south-eastern edge of Billesborg wood, or just in one with the middle of the houses of Billesborg, leads to the northward of the shoals in 5 fathoms.

Giörslöv mansion is easily known by its low, square, and flat-roofed tower, and if kept in one with the houses on Sonakke Point it will lead east of the shoals in 5 fathoms. Again, Magleby church and the west end of Giörslöv park leads to the westward of the shoal, in 5 fathoms.

Sönakke Point. 446. Sönakke is the name of the south-eastern point of the bay: there are some houses on it, and abreast of them some small shoals with 17 to 23 feet water, but a mile only distant from the shore.

Kiöge Road. 447. The whole of Kiöge Bay having good holding-ground may be considered as a fit anchorage for a fleet, and has in former wars often been used as such; the best position is in the interior part of the bay, abreast of Kiöge, and inside of Juels Ground; as there Falsterbo and Stevns Capes afford shelter from the Baltic. Ships-of-war being always provided with heavy ground-tackle may ride it out there to the last, but it is a less convenient place to quit than from an anchorage farther out. Water may be conveniently procured in Kiöge harbour.

The only places of refuge in the bay for small craft are Kallebo and Kiöge harbour.

Kallebo Strand. 448. Kallebo Strand is the large shallow inlet, which leads from the southward into Copenhagen harbour. The natural

effect of the current is to keep open a narrow channel through it, called the Sorte Rende, with 11 to 12 feet water, and nearly in a straight line as far as Strandgaard, where there was formerly a long wooden pier, which is now in ruins. This narrow inlet leads between the rocky bank along the Siælland shore and the two nearly dry shoals called the Svenske Holm and Skrædder Holm on the opposite side. The western side of this channel is marked by two pole-beacons with brooms, the outermost of which is named the Sandhage-broom, and the other the Muursand-broom; and on the other side of the channel stand two poles carrying wooden crosses, the outermost being on the Skielsand and the innermost on the Lyse Ground. Vessels not drawing more than 10 feet may enter this inlet by keeping the conspicuously elevated church on Brönshöi in one with Petersborg, a lonely house in a low situation; but the inlet with this depth being only 40 fathoms across, vessels of that draught have not sufficient room to bring up, and are obliged to run aground near the pier, though small craft may safely come to an anchor. From thence a narrow channel or ditch has been dredged up to Copenhagen, containing everywhere 6 feet water, or more; but it is so narrow as scarcely to allow two small craft to pass each other. Its western side is marked by 13 pole-beacons driven into the ground, and each carrying a broom; whereas on the Amager side, as likewise on some rocks in the Tresteenlöbet, or Three-rock channel, the beacons are distinguished by crosses. Outside of these marks is the only place where a few small craft have sufficient room to bring up. On the western side of this channel the Tornö rock, lying in 5 feet water, has but 1½ feet over it, and is marked by a cross. The bearings from this rock are Taarnby church S.E by E. ½ E.; and the steeple on the exchange N.E. by E. *Sorte Rende.*

449. Between the Svenske and Skrædder Holms, but outside of the cross of the Lyse Ground, is the entrance to the Mellem Löbet or middle channel, in which a couple of rocks are pointed out by poles; and between the Svenske Holm and the Kolapperne Bank (where there are many small sandy cays covered with grass) lies the crooked Kolappe Channel. On the south-west side of Svenske Holm, at the mouth of the Mellem Löbet, there is a pole and cross, from which Brönshöi church bears N. ½ E., and Taarnby church E. ½ N. *Mellem Löbet.* *Kolappe Channel.*

These two last-named channels having only 4 feet water, are only fit for boats, and they join the main channel at the Knæk-brooms, the 4th and 5th from Strandgaard pier.

Pilot. This inlet, important during a war, with regard to the supply of the city of Copenhagen, is at other times frequented only by boats from Kiöge and Stevns. A pilot for it is stationed at Strandgaard, and attends when the signal is made.

450. It ought to be observed, that a gale from the N.W., which is always accompanied by higher water in the Sound, produces a lower water-level to the southward of the narrows in Kallebo inlet, the free passage of the water being restrained; so that during a continuous N.W. gale it is sometimes nearly dry, the narrow channels excepted. For the same reason, S.E. gales produce higher water here; and the free passage of the water being obstructed by the shallows between Siælland and Amager, an entirely different waterstand takes place in the different parts of Copenhagen harbour.

451. Every vessel not employing a pilot, and not carrying sand or fresh fish, is bound to pay for the marks at the following rate: —vessels whose burden is above 4 com. lasts pay half pilotage, and smaller ones pay 18 rbsk.

Kiöge Harbour. 452. At the town of Kiöge, and in the mouth of the Kiöge Aa rivulet, there is a little harbour, formed by two parallel piers built at an angle with the old pier, behind which lies an inner harbour. The new harbour admits vessels not drawing over 11 feet; but it is exposed to the eastward.

Harbour Lights. *Pilots.* Two harbour-lights, 39 and 33 feet high, kept in one, is the mark for entering the harbour. Pilots are stationed there; but as the bay is entirely clear of any danger to such a vessel as would run for this harbour, they but seldom go far out.

Cape Stevns. 453. The name of Stevns Klint is given by the Danes to the high promontory to the southward of Kiöge Bay; it is 8 miles across, and part of it consists of a steep, white chalky cliff, round which the shallow bank is very narrow.

The southern point of this foreland is Cape Stevns, on the summit of which, called the Höiesti, a height of 123 feet, stands a Revolving Light, elevated 144 feet above the level of the sea, and exhibiting its bright light every half minute, which may be seen from 16 to 18 miles in clear weather, a benefit of great importance to vessels rounding Falsterbo Reef. The appearance

Revolving Light.

of the light-house in the day time is that of a common white-washed farm-house near the edge of the cliff, but at its eastern end there is a semicircular addition containing the light.

The most prominent point of the cliff is Mande Head, 98 feet high; and between it and Sönakke Point there is a shipping-place abreast of the wood. It may be known by a high, white-washed storehouse, and sheltered by a projecting shallow to the northward, in which there are only 6 to 8 feet water. *Mande Head.* *Shipping-place.*

454. Close to the north of Mande Head there is a deep fissure or chasm in the cliff, called the Kalksteens Rende, and abreast of this lies the Kalk Ground, projecting half a mile from the beach, and carrying only 3 to 4 feet water, while there are from 6 to 7 fathoms close to; and on this shoal about 2 cables' lengths from the shore there are some rocks with only 1 foot water. *Kalk Ground.*

Stevns Lighthouse kept outside of Mande Head, when coming from the southward, and Giörslöv park seen outside or to the N.E. of the beechwood, when coming from the northward, lead just outside of the Kalk Ground; and off its outer point there is a floating beacon, with staff and broom, in 6 fathoms. *Beacon.*

455. To the southward of Cape Stevns, and between it and Möen Island, lies Faxö Bay,* deriving its name from the conspicuous church of Faxö, nearly 3 miles inland, and elevated 250 feet above the sea. The depth in the bay outside the shallow gradually decreases from 8 to 4 fathoms, the bottom consisting of different sorts of sand, now and then mixed with gravel. The north-east point of the bay is close to Höistrup church, which is very conspicuous from its position close to the edge of the cliff. The shallow off the beach is here very narrow to Rödvig Fort, where a wooden pier, 287 feet long, has been run out in a W. by S. direction, at the head of which there are 8 feet water, and 5 feet farther in; but vessels lie there well sheltered from easterly and southerly winds, which produce a heavy sea outside. In entering, take the pier closely, as 20 yards west of the pier-head there is a rock with only 4 feet water. The pier has been filled up with stones, and it is intended to lengthen it so as to afford more protection. *Faxö Bay.* *Rödvig Pier.*

456. Felskov Reef extends $3\frac{1}{3}$ cables' lengths from the point, S.E. of Höistrup church, and is steep-to at its ex- *Felskov Reef.*

* See chart of Baltic, Femern to Bornholm, Sheet I.

tremity. To pass to the eastward of it in 4 fathoms, Lille Hedinge church is to be kept in one with the comptroller's house at Rödvig, which stands to the eastward of the fort, and is conspicuous. Small craft may cross the reef in 2 fathoms, by keeping Höistrup church in one with the southern part of a very remarkable chasm in the cliff, which is named Boesdal. The church, half-way between Boesdal and the south point of the cliff, leads to the eastward of the reef in 4 fathoms water, and it may be passed to the southward by keeping Faxö church in one with the eastern edge of the wood: but this mark is less distinct. S.S.W. from Höistrup church, a mile off shore, there is a rock with 19 feet water.

Vemmetofte. 457. Along the shore west of Felskov Reef, abreast of Vemmetofte, the shallow widens, and from thence to the shipping-place on Faxö beach it is 1½ miles in breadth, with rocky ground along the shore till past the wood to the westward of Vemmetofte. At Vemmetofte there is a landing-place for boats.

Faxö Shipping Place. *Pilots.* At Faxö beach there is a wooden pier, 820 feet long, with 9 feet water at the pier-head. At Lunde village pilots are stationed, and a boat-harbour has been formed there.

From Faxö beach to half way along the peninsula of Fedet the shallow rapidly diminishes to a cable's length, but again increases to the southward.

Fedhage Spit. 458. Off the southernmost end of Fedet Peninsula, the Fedhage Spit projects in an easterly direction half a mile; and at its eastern end, at a common water-stand, a broom-beacon stands in 7 feet water, but with 13 feet close to it.

Sandene Shoals. 459. Along the shore between Rönneklint and Jungs Head a large and nearly dry shoal, called Sandene, or the Sands, stretches 2 miles towards the north and east; and consists of hard sand and rocks, particularly near the beach. The northern end of the surrounding bank is called the Nordmand Flat, and a red buoy, in 11 feet, is placed on its N.W. extremity, the mark for which is Roholte church in one with the south side of a large farm called Strande-gaard. Close to the eastward of the buoy there are but 7 feet water, whereas half a cable's length N.W. there is a depth of 7 fathoms, in the entrance of Præstö Inlet.*

Nordmand-Flat Red Buoy.

* See Plan of Bögeström and Ulfshale Channels.

S.S.E. ¼ E., 5 miles from the above red buoy, there is a black buoy, carrying a pole and broom, in 10 feet water, and lying at the mouth of the Bögeström Channel. In the interval between these two buoys the depth is uneven on the shelves; to the eastward it generally increases, whereas to the northward it suddenly falls into 5 or 6 fathoms. *Bögeström Black Buoy.*

460. From the Bögeström buoy the outer flat extends towards the S.E., and finishes in an angle, called the Hollænder Ground, which projects 5 miles from the peninsula of Ulfshale, or the low northern part of Möen. Close outside the Hollænder Ground lies the Gyldenlöve Flat, with 22 feet water, the outermost extremity of which is distant 7½ miles from the shore. To the southward of these flats there is a deep bight in the sands and in the shore of Möen, called Söhunde Bay, and along its shore, as well as the remainder of Möen, the shallow is but of small extent. To pass outside of the Hollænder Ground, when coming from the northward, the white cliffs at Möen may be run just behind the high greyish-looking shore north of the cliffs; and Stege church in one with the western end of Speilsby, a village on the eastern side of a small grove, named Dommervigen, likewise leads to the eastward of the shoal. *Hollænder Ground.* *Gyldenlöve Flat.* *Söhunde Bay.*

461. Before describing the anchorages, it will be proper to mention the shoals in the inner part of Faxö Bay, viz., the Middel Ground, the Fedhage, the Hestesko, and the Steenröse.

The Middel Ground is a detached shoal, 6 cables' lengths long E. and W., but only 2 across; it lies between the Sandene and Fedet peninsula; and its least depth is 13 feet on a spot of small circumference, consisting of hard sand and seaweed, with a few rocks. The western end of this shoal is only 2 cables' lengths from the shore of Fedet, and in the channel between them there are 4½ fathoms. The channel on the eastern side of the shoal is only 2 cables' lengths across, and has a depth of 4 to 6 fathoms. *Middel Ground.*

462. Between Fedhage Spit and Maderne Island, which lies a mile north of Rönneklint village, there is a bank called the Hestesko, on which there are 3 feet water on fine sand; it extends E. and W. nearly 3 cables' lengths, but only half as much across. Its northern side, bounding the inlet to Præstö, is steep, and carries a broom-beacon; but it has a narrow sloping tail to the eastward. *Hestesko Shoal.*

Steenröse Reef.

463. Off Rönneklint the Steenröse Reef stretches off N.E. by N., to the distance of 1½ miles; on its inner part there are only 3 to 5 feet water, and 7 to 10 feet on the outer half, and it is all sand and rocks. The eastern side of this reef is separated from the Sandene by a narrow passage and a basin, with a depth of 3 or 4 fathoms. And on its western side, which forms the channel, there are two broom-beacons, standing in 10 feet water in the direction of N.E. by N., and S.W. by S. from each other, and 1¼ cables' lengths apart.

Faurby Bight

464. In Faurby Bight, between Vemmetofte and Strande-gaard, there are several places from whence a considerable quantity of lime is shipped. The anchorages are well sheltered towards north and west; and a good berth will be found half a mile from Vemmetofte pier, in 11 to 13 feet water, sandy bottom, with Lille Taaröie village in one with the S.E. part of Malund wood, and Ourup mill just to the southward of Strand Wood. Small craft and boats may run alongside the pier, by keeping three chimney tops of a house to the eastward of the pier in one, as to the westward of this line rocks will be found. On the flat off Faxö strand, half a mile from the beach, in 13 to 15 feet water, with a clear sandy bottom and gradually shoaling, small craft may approach the shore to a convenient depth. All the different shipping places and anchorages are indicated by flag-staffs.

Præstö Inlet.

465. Between the shallows in Faurby Bay and Sandene lies the inlet to the town of Præstö, leading past Strande-gaard along the Fedet shore and round its southern end. This inlet, as far as the Middel Ground and the Hestesko, would admit ships of the line, for which there is an excellent road off Strande-gaard, and likewise another, still better sheltered, but narrower, inside of the Middel Ground.

Strande-gaard Road.

466. The approach to Strande-gaard Road is round the north end of Sandene, the channel between which and the shore-shallow is from 4 to 5 cables' lengths across, and from 8 to 5 fathoms deep. A large ship bound to this inlet ought to keep 2 or 3 miles outside of Felskov Reef, and then to steer W.N.W. ½ W. directly for the point at Strande-gaard, until Faxö church bears N. by W. ¾ W. in an opening between two small woods to the westward of the shipping-places, and in one with the second flagstaff from the eastward. On this mark the ship

is close outside the entrance between Sandene and the shallows, and the course then to be steered is W. ¼ S. mid-channel, in 7 and 6 fathoms, minding not to approach the red buoy at Nordmand Flat within 2 cables' lengths. The mark to pass north of Sandene, in 21 feet water, is the white gable of the southernmost house of Lindersvold, just open to the southward of the small grove west of Strande-gaard; and to run along the shore-shallow in 4 fathoms, keep the western end of Nebbe Wood in one with the north end of the highest hummock of Blaabierg.* Keeping this mark well closed, viz., the western end of Nebbe Wood, just past the hummock, the depth mid-channel will be 7 fathoms; and this mark will likewise lead to the northward of two small shallows with 4 fathoms water, which are passed when Faxö church opens to the westward of the house on the cliff, near which is placed the westernmost flagstaff. Arriving on these two marks simultaneously, viz., Lindersvold Gable open of the wood, and the western end of Nebbe Wood in one with the northern end of Blaabierg hummocks, you may edge a little more southerly, so as to bring Lindersvold open to the southward of the wood at the same time that Skibbinge church is well open to the southward of the highest hummock of Blaabierg. Steer on this mark S.W. by W. ¼ W., inside of Nordmand Hage buoy, until Ourup mill is in one with the north end of the above-mentioned grove, and Rönneklint battery is in one with the eastern end of the village of Rönneklint; you may then bring up in Strande-gaard Road, to the northward of the Middel Ground in 5½ fathoms, sand and clay, and moor with an open hawse towards N.E., the only wind likely to occasion any sea of consequence. *Strande-gaard Road.*

467. If the intention be to run in past the Middel Ground, bring Ourup mill halfway between Strande-gaard and Roholte church, and then steer S. ¼ W., between the Middel Ground and Sandene, taking care not to come more westerly in this narrow channel than to bring Ourup mill in one with Roholte church; and not more easterly than Rönneklint battery being in one with the middle of the village of Rönneklint. Being at the same moment on each of these two marks, and therefore abreast of the eastern end of the Middel Ground, the course to *Fedet Road.*

* View 23.

be shaped is S.S.W., or continue on the last-named mark till Roholte church comes over the middle of the small grove, west of Strande-gaard, when the anchor may be dropped in Fedet Road, in 5 or 6 fathoms, bluish clay. This road is to every large ship an actual harbour, but the room being limited, it is requisite to moor, for only three large ships can find room enough there at one time.

468. Small vessels have plenty of room in entering these roads, as they can approach the shallow in 15 feet, and can cross Sandene by attending to the following marks: Roholte church in one with a lonely tree on the north side of a cliff near the beach, between Strande-gaard and the park of Dyrehave, leads across the Sandene in 20 feet; and the church in one with this same yellowish cliff leads across in 16 to 18 feet. Continue on this last mark until Faxö church is in one with the eastern side of the park, and Skibbinge church in one with the southern end of the highest hummock of Blaabierg; then steer S.W. by W. ½ W. until past the buoy, which should be left a full cable's length on the port side, and until Rönneklint battery is past the middle of the village. Keeping on this last-named leading mark, steering S.S.W., a vessel not drawing more than 12 feet may run in as far as the road at the Hestesko shoal passing to the westward of the two brooms on the Steenröse, and then the best anchorage is between them and the outermost broom off Fedhagen in 13 to 18 feet water, clayey ground. This road is much frequented by coasters during northerly and easterly gales in spring and autumn.

Hestesko Road.

469. Working in, particular care is requisite to avoid the shallow along the shore, and till near the Middel Ground not to stand in nearer than 4 fathoms, as the shallow is steep-to, particularly to the southward of the line of Roholte church and the south end of the small Strande-gaard Grove. To the southward of the Middel Ground it is also steep-to, but there its edge is easily distinguished, as well as at Fedhagen, by the tint of the water on the light-coloured sandy bottom. Off Sandene, to the northward of the Middel Ground, it is necessary to tack when Rönneklint battery comes in one with the middle of the village, until you are so far to the southward as to have Ourup mill in one with the eastern side of the grove; Sandene may then be approached according to the draught of the vessel by the lead, but mind-

Turning Marks.

ing to keep Faxö church hidden behind Dyrehave Park, until being so far to the southward as to see Præstö church over Nebbe Wood. From thence it is again necessary to tack on the before-mentioned marks, the battery of Rönneklint in one with the middle of the village.

470. Finally, small craft not drawing more than 6 feet may cross Sandene in 8 feet water by steering W.S.W. ½ W., and keeping 2 small hummocks covered with trees in a line with the western end of Nebbe Wood; but this mark is not easily made out. *Passage across Sandene.*

471. At Rönneklint pilots are stationed, who attend when the signal is made, and not only take charge of vessels to or from these roads, but have the monopoly of the interior pilotage to Vrangströmmen, Nebbet, and Sovekrogen, and likewise to the town of Præstö, and its large fiord, the navigation of which has been much facilitated by the many brooms which mark the channels. All vessels are, however, recommended to employ a pilot, as the expense is trifling, and as the toll for the marks, 6 rbsk. pr. com. last, is to be paid at all events. The narrow, crooked, and intricate channel from Hestesko road to the town of Præstö is 3 miles long, and has recently been dredged out to a depth of 10 feet, and distinctly marked by brooms. There is also the same depth of water in Præstö harbour. *Pilots.* *Præstö Fiord.*

472. Præstö Fiord, north of the town, is a large basin with 12 feet water, but in its narrow and intricate entrance there are only 6 feet, and accordingly it is only frequented by boats going to and fro between the different gentlemen's seats in the vicinity.

No tide is perceptible here, but westerly winds occasion an eastward current, and a fresh gale from N.E., on the contrary, makes a rapid inset, and produces a high water-stand. *Tide and Current.*

473. In the southern part of Faxö Bay, and close to the N.W. point of Möen, lies the little island of Nyord, far inside the outer edge of the shallow. It is a station for the pilots, who are chiefly employed in the two channels between the islands, viz., the Bögeström, between Siælland and Nyord; and the Ulfshale between Nyord and Möen. This latter channel was the only one during the last war, and then very much frequented; but after the removal of some rocks in the Bögeström the Ulfshale channel has not only been abandoned, but by the shifting of the sand it has now not more than 4½ feet water, whereas the other admits vessels drawing *Nyord. Pilots.*

Bögeström Channel.

7 feet water. The Bögeström is, therefore, a channel of great importance with regard to the coasting trade, and is marked by a black buoy with a stick and broom placed at its mouth in 10 feet water. The mark for this buoy is, the south end of Sandvig Kohave in one with the southern edge of Jungs Head beech-wood. From abreast of the buoy two different channels lead between the shoals, viz., the above-mentioned Bögeström, between Siælland and the Sælöerne Shoals partly dry and full of rocks, and on the S.W. end of which is the small island called Danmarksholm, and the Ulfshale or Ægholm channel, between the Sælöerne shoals and the bank that surrounds Nyord Island; but not only is the Bögeström the deepest of the two, but it is besides well marked by brooms, and is, therefore, the common and best passage, though in some places so narrow as scarcely to allow two vessels to pass each other.

Sælöerne Shoals.

Ulfshale Channel.

474. The entrance to the Ulfshale Channel, between Nyord and Möen, is about 1¾ miles S.W., of the Hollænder Ground, and is very changeable. At its mouth there is a bar, on which, in 1842, there were only 4½ feet water, and the course across this bar was then N.N.W.; a beacon has now been placed there on the mark of the three remarkable hillocks on Möen in one with Elmelund church, likewise on Möen.

Vessels using either of these channels are bound to pay pilotage when a pilot offers his service, or if a vessel not choosing to wait for a pilot, follows the track of another vessel with a pilot. Besides, every passing vessel is bound to pay a regulated toll for the marks, and 12 rbsk. for the issuing of the pilot bill.

Söhunde Bay.

475. Söhunde Bay, north of Möen, is entirely exposed to all winds, from N.N.E. to S.E., and even more southerly: the depth is from 4½ to 6½ fathoms, sand, with one spot in the middle, on which there are but 22 feet. Water might be had near the beach to the eastward of the estate Nordfeld, where the abundant water of the Borre meadows runs off.

Möen Cliffs.

476. At Brune Head the shore begins to rise towards the high chalk cliff, which forms the eastern side of the island, and is well known by seafaring men under the name of the Speil Klint. Its highest summit, the Aborre Bierg, is 472 English feet above the level of the sea, and may be seen 9 leagues. Four other conspicuous parts of the cliff are called the Taleren, Hylledal,

Dronning, and Sommerspiret. Along this part of the shore the shallow is narrow and steep from the depth of 4 fathoms at only a quarter of a mile from the beach, and is full of rocks, which, at the N.E. angle of the island, off Hellehavn Point, forms a reef that projects 2 cables' lengths. At Taleren, likewise, the shallow is rocky to the distance of a cable's length from the beach. Between Brune Head and Hellehavn Point there is a little bay to the eastward of Lille Wood, and at the mouth of the Pomlerende stream, where there is a clean sandy bottom, and a convenient place for boats to land.

Danneskiold Shoal.

477. Outside of the shallow there are a couple of detached shoals, for which reason vessels ought not to approach the shore, between Hellehavn Point and the south-eastern extremity of Möen, within the distance of two-thirds of a mile, nor into less than 8 fathoms water. The northernmost of these shoals, the Danneskiold, lies abreast of a chapel, built close to the beach on Lise Wood. It extends along the shore half a mile, and has generally 18 to 22 feet water, but in one part, for a cable's length at a third of a mile from the shore, it has not more than 12 feet, and in the middle of that there is a spot with only 7 feet water. Between the Danneskiold and the shallow of the beach there is a passage with 4 or 5 fathoms water. To pass the shoal to the eastward the remarkable cliff of Taleren must not be brought to the southward of S.S.W., and when Brune Head shuts in behind Hellehavn Point you are close outside the shoal in 5 fathoms.

Slotsgavlen Shoal.

Nearly at the same distance from the shore, and a half a mile to the southward of Danneskiold, abreast of the Slotsgavlen, is another rocky shoal with 22 feet water.

Dronning Shoal.

478. Abreast of the Dronning cliff lies the Dronning Reef, nearly 4 cables' lengths long and one across, and on all sides steep-to from 5 fathoms. On the shoalest part there are but 11 feet water, and though only 4 cables' lengths from the beach, it is separated from the shallow by a channel with 4 or 5 fathoms. On the edge of the shallow, along the beach inside of Dronning Reef, there is a narrow ridge of rock carrying 13 feet water. It is $2\frac{3}{4}$ cables' lengths long, and inside of it, at 2 cables' lengths from the beach, there are 3 fathoms. To pass to the northward and eastward of the Dronning Reef, the northernmost extremity of the white cliff is to be kept in sight outside of Taleren cliff; and,

Marks.

conversely, if coming from the southward, this mark must be opened before a course can be shaped along the cliffs. To pass to the southward of the reef, keep that conspicuous cliff, the Sommerspiret to the westward of W. ¼ S., and on either of those two marks the depth will be 6½ fathoms, at 1½ cables' lengths from the shoal. To the southward of Dronning Reef, and abreast of the Sommerspiret, there is a good holding-ground, and good shelter against gales of wind from N.W. to W.S.W.

479. From Dronning Reef round to the S.E. point of Möen, the rocky shallow is not quite so steep, and the 4 fathoms line is distant about a third of a mile from the shore; but farther out lies Bielke Flat, the outer edge of which, in 5 fathoms, is a mile distant from the shore, and due south of the battery. This flat or shoal is everywhere foul, and on its northern end, half a mile from the beach, there is a rocky patch with only 20 feet water; so that large ships ought not to approach the south-east point of Möen within 1¼ miles, nor into less than 7 fathoms water. When the remarkable hill of Kongsbierg is in one with the battery you will be to the eastward of the flat. Small craft coming from the northward, and bound to the eastward, may coast along the cliffs until Stege church becomes visible well to the southward of the low cliff, on the southern side of the island; and this mark leads clear of the shallow off the point.

Bielke Flat.

480. To the eastward, distant 9 miles from the cliffs of Möen, lies the Krieger Flat, extending east and west 12 miles, and north and south 5 miles. Its depth is from 9 to 12 fathoms, over sand; whereas all round it the bottom is soft, and the depth greater, so that in foggy weather the lead will afford good information.

Krieger Flat.

481. On the south-east point of Möen there is a Fixed light, dioptric and of the 4th order; the lighthouse is 33 feet high, and the light, being elevated 82 feet above the level of the sea may be seen 12 miles off. It is visible from Grön Sound round by south and east till it bears S.W. ¼ W., when it is hidden behind the cliffs of Möen.

Möen Light.

482. The great bay on the south side of Möen is called Hielm Bight, along the shore of which the shallow is clean and pretty steep, the 4-fathoms edge being not less than 2 nor more than 3 cables' lengths from the beach. Off the cliffs there are a few rocks, but to the westward of Budsemark village the clean

Hielm Bight.

sandy bottom comes close in shore, and outside of the shallow it is gravel with pebbles and reddish sand, and farther off, in 9, 10, and 11 fathoms, sleek.

483. The Böcher Ground is the only shoal spot in the bay. *Böcher Ground* having only 20 feet water, and steep-to from 5½ fathoms all round. The marks for this shoal are, Stege church in one with some conspicuous willows in Tövelde field, and the highest part of Hielm cliff bearing W.N.W. ¾ W. This cliff is remarkably steep, with a whitish tint and a dark stripe down the cliff.*

484. Hielm Bight terminates in Madses Point, a little, yel- *Madses Cliff* lowish cliff, forming the eastern point of Grön Sound, or the channel between Möen and Falster Islands; but the description of this opening is reserved for a future section.

* View 24.

CHAPTER VII.

THE GREAT BELT.

Reef Ness. 485. The entrance to the Great Belt from the Kattegat,* leads through the Seierö Deep (§ 211), and then between Samsö and Reef Ness; but vessels ought not to pass nearer to that *Puller.* point than 9 fathoms, the outermost rocks of the Puller being fully a mile from the point, carrying only 9 feet water, and being pretty steep-to. Between the Pullers and the shallow reef projecting from the point, there, however, is a 20-feet channel; and again, through that reef there is another passage of two-thirds of a cable's length wide, but with only 6 feet water.

Light. 486. On the point, therefore, of Reef Ness, which is so very important for the navigator to see, a katadioptric Fixed light, of the 4th order, has been placed. It is elevated 65 feet above the level of the sea, and may be seen 13 miles from the deck of a vessel 10 feet above the water, when it is between the bearings of W. ¼ N. and (round the compass to) N.N.W. ¼ W. The lighthouse is 30 feet high, and whitewashed.

Buoy. At the end of the reef, in 6 fathoms, there is a black and white chequered buoy carrying a ball on a white pole; from this buoy the lighthouse bears S.E. ¼ E., distant 1130 fathoms, or 1⅛ miles, Aarby church being just visible to the southward of the Reef Ness shore.

487. The next point of Siælland, to the southward, of Reef *As Ness.* Ness is the somewhat less projecting point of As Ness, which is surrounded by an extensive flat to the distance of nearly a mile towards the N.W. and 1½ miles S.W., and in this direction there are several detached rocks of which one carries only 6 feet; they form together a reef, across which there are channels with 2 to 2½ fathoms water between the rocks, and with sandy bottom. This depth and bottom is general for the rest of the flat.

The mark for the extremity of the As Ness reef is Rörby

* See Chart of the Kattegat, Sheet I.

church just in one with the south side of the As Ness shore, and at the same time Skambek windmill is just visible outside the north-west point of As Ness; within these marks no vessel ought to come. The north-western corner of the flat having no reefs, smaller vessels may cross it in 2 to 3 fathoms, minding to keep Raklev church open to the northward of As Ness; but the lead is to be kept going, and the shore is not to be approached within a depth of 2 fathoms.

488. Between these two forelands, the Reef Ness and the As Ness, lies the deep fiord of Kallundborg, which is not only without any detached shoals, but carries along the shore of both sides a depth of 4 fathoms at only 2 cables' lengths from the beach. On the Reef Ness side there is only a single rock near the shore; it is dry at low water, and lies 1⅛ cables' lengths from the beach abreast of Bavnehöi hill; but the margin of the As Ness shore is rocky, except in Havnmark bay, which is perfectly clear, and where vessels may find good anchorage with the winds from S.E. and S. to W. *Kallundborg Fiord.*

Count Lerche has erected, in the vicinity of Havnmark house a large edifice covered with tiles for a herring saltery, and as a refuge for the fishing-boats, a harbour, the pier of which extends first about 200 feet eastward, and then 120 feet southward. Along the inner side of the pier there are 11½ feet water, gradually shoaling towards the shore and perfectly sheltered against all winds. This harbour may be of great use to the ferry vessels in case of Kallundborg harbour and the inner part of the fiord being blocked up by ice. *Lerche Harbour.*

The mark to enter the fiord is Kallundborg church well open to the southward of the Reef Ness shore. This mark leads along the shore, on which will be seen Skambek wind and water mills, and east of them a house, where a sandy flat commences in a somewhat curved direction, and extends to the low point of Gisselöre. On this sandbank the depth varies from 1 to 2½ fathoms, and close to its edge 5 fathoms. In entering the fiord, particularly with a northerly wind, mind and take care not to run on the back of that sand, which is to be avoided by keeping Rörby church only a little north of Aarby church: half a cable's length outside of Gisselöre sand, and with Kallundborg church bearing N.E. by E. ½ E. there is a white buoy to give warning of the sand. *Buoy.*

The last mark answers likewise for running up the fiord, but just in passing to the northward of As Ness Flat, bring Tömmerup church behind Kallundborg church, which is a leading mark into the fiord. The common depth in the fiord is 7 fathoms, very good holding-ground everywhere; large ships may run in so far as to have Kallundborg church in one with Gisselöre Point, and then drop the anchor in 5 fathoms, halfway between the point and the As Ness shore. Westerly and northwesterly winds may indeed occasion some swell in the fiord, but the holding-ground being good, vessels may easily ride out there. Small vessels may run inside of Gisselöre Point, which may be taken close, and then bring up between the point and the pier of the town in 2 fathoms, when Hedevig, a farm belonging to Lerkenborg is open a very little to the eastward of Gisselöre Point. However, the bottom here being thickly overrun with seaweed, it is necessary in blowing weather to pay out plenty of cable quickly, so as to allow the anchor to get hold in the ground. Along the pier there are 11 feet, and in the harbour inside, 6 feet. The harbour light on the pier is Fixed, and may be seen 5 or 6 miles.

Gisselöre Point.

Kallundborg Harbour Light.

Pilots. The pilots living in the town of Kallundborg commonly meet vessels a short distance outside of Gisselöre Point, but they are of no great use in this open fiord; whereas, were they stationed at Reef Ness, they would be able to pilot through the Belt. The pilot establishment has to place and keep in repair a number of beacons, for which the beacon-money is paid by every vessel above 3 commerce lasts burden, ferry boats and mail-steamers excepted; with 2 rbsk. per last, as well for inward as outward bound vessels.

Jammerland Bay. 489. Between As Ness and Reersö* the shore forms the bay of Jammerland, in which the breadth of the shallow along the shore is variable: thus along the south side of As Ness there are 8 or 9 fathoms only a quarter of a mile off, whereas to the southward of Lerkenborg the 4-fathoms line is half a mile from the beach, and abreast of Svallerup church and Urhöi Hill the flat extends to the distance of nearly 2 miles, with only 10 feet water a mile off shore. South of this flat there is again deeper water near the shore, towards which the water gradually shoals, and good

* See Entrance to the Baltic, Sheet III., Great and Little Belt.

anchorage may be taken there in 3 to 4 fathoms sheltered against N.E., E., S., and S.W. winds, with plenty of room to beat out. The depth in the bay farther out towards the Lyse Grounds is from 5 to 7 fathoms.

Reersö is a peninsula, the north-east side of which joins Sjæl- *Reersö.* land, and surrounded by a gradually shoaling bank. On its south-west side, 3 cables' lengths from the beach, there is a rock *Reersö Rock.* which dries a couple of feet with a common waterstand, and close round it a fathom of water and a flat; between this rock and the shore there is a passage with 8 or 9 feet.

490. In Arts. 218 to 222, the marks have been given for passing the different shoals connected with Fyen Head, and from this *Fyen Head.* point to Staver Head the water gradually shoals to the shore, so that it may be approached by sounding. Small craft closely hug the shore to avoid the Snaverön Rock, which has but 7 feet *Snaverön Rock.* water as laid down in the chart. Eastward of this shoal, and $2\frac{1}{8}$ miles from the shore, there is a very narrow rocky ridge, but *Savesborg Ridge.* carrying nowhere less than 4 fathoms, and 8 or 9 on either side over a clay bottom. This ridge is not dangerous though annoying to large ships, as was the case with the English line-of-battle ship the Polyphemus, during the last war.

491. Off Staver Head lies the island of Romsö, covered with *Romsö Island.* wood, and surrounded by a flat which everywhere may be approached by the lead. From its western point a long low neck of land stretches off to a reef, the extremity of which is named the Klæpen, and is dry, with a common waterstand. On the north-east side of the island the flat is rocky to the distance of 2 cables' lengths from the shore, or out to 2 fathoms; and close in shore there are several rocky patches with 5 or 6 feet water. To the southward of the island there is another 6-feet patch, but with 2 to 3 fathoms water all round. The mark for it is the direction of the easternmost stone hedge on the island, just seeing the stones on the west side of the hedge, and at the same time Bögebierg Hill in one with a few single willows standing on the western side of the island.

There are anchorages on both sides of the neck of land men- *Anchorages.* tioned above. On the north side a good berth will be found in 3 fathoms, with the north point of the island bearing east, and the Klæpen in one with the point of Staver Head, being there sheltered against E., S.W., and W.N.W. winds. To the south-

ward of the reef small craft may have a good anchorage in 2 to 3 fathoms off the south-west side of the island, sheltered against all winds from W.N.W. round by N. to E.N.E.

Romsö Channel. The channel between Romsö and Fyen may be passed without getting less than 4 fathoms, and close to the Klæpen there are from 2 to 3 fathoms.*

Coming from the northward, the island of Romsö may be passed pretty closely without any risk, particularly on the south-east side, where the depth is 2 fathoms close to the beach; but if bound to Kierteminde, Bögebierg is not to be brought in view to the westward of the island before the whole of Kierteminde town becomes visible south of Staver Head, in order to pass to the southward of the rocky ground off the south side of the island.

The detached shoals to be avoided in this part of the Belt are: the Ryggen, the Lyse Grounds, and the Elephant Ground.

Ryggen. 492. The Ryggen lies between As Ness point and the shore of Fyen, from which it is about 3½ miles distant. The marks for it are: Raklev church in one with the western edge of As Ness wood, and Koldby church, in the island of Samsö, open to the westward of the wood on that island. The shoal is foul, having several large rocks with 3 fathoms, which extend nearly a cable's length E. and W., but only a third of a cable's length N. and S. It is surrounded by a flat, on which there are from 4 to 6 fathoms. To pass it to the eastward, large ships ought not to run Koldby church to the westward of the wood on Samsö before Raklev church is in one with the middle of As Ness Wood.*

Lyse Grounds. 493. The Lyse Grounds lie between the two points of As Ness and Reersö, and consist of three different flats, on which the least depth is 17 feet, white sandy bottom; between these patches there are channels, but no marks for navigating them can be given. Large ships in passing to the westward of the northern end of these shoals must not approach Siælland nearer than to keep As Ness in one with a third of the distance from Ulstrup to Raklev church, on the Reef Ness shore.

494. Rather to the northward of a line from Romsö and Reersö, and nearly half way across, lies the Elephant Ground, one of the most dangerous shoals in the Belt, for it has only 10½

Elephant Ground.

* Views 25 and 26.

feet on its southern end, and a flat extends each way of nearly two-thirds of a mile, with 18 to 23 feet. It may, however, be approached by the lead, and large ships ought not to stand nearer to it than 6 or 7 fathoms. Off its north end there is the deepest water, as at only 3 cables' lengths 14 to 16 fathoms will be found. On its shoalest part there is a floating beacon with a checkered pole and a red ball. *Beacon.*

Both Fyen and the opposite shore of Siælland supply good marks for clearing this shoal. To pass it to the northward keep Viby mill in one with the north end of Romsö; and to the southward keep the northernmost mill at Kierteminde well open south of Staver Head.* At Dalby village, in Siælland, there are three remarkable hills called the Dalby Banks, and when these are in one with the large and northernmost cliff on Reersö you will be to the northward of the Elephant; and, on the contrary, these hills brought in one with a smaller cliff south of the former will lead to the southward of the shoal.†

495. Between the peninsulas of Reersö and Halskov the coast of Siælland forms Muusholm Bay, in the northern part of which lies Muusholm Island, connected with Reersö by a flat, having, where deepest, 3 fathoms water. Inside of this flat, between Siælland and the eastern side of Reersö, there is good anchorage for small craft in 2 to 2½ fathoms, with such excellent holding-ground that they can ride out a southerly gale, the only wind that raises any sea there.

496. The eastern side of Muusholm Island forms a bay, half a mile long by 1⅜ cables' lengths, named Muusholm Harbour, which affords an excellent anchorage on the marks: Vemmelöv church, just shut in with the S.E. point of the Island, and Giörlöv church in one with the north-east end of the island; a cable's length from the beach, in 2½ fathoms water, on clay under a thin layer of mud, and with plenty of room to veer out cable. Vessels are *Muusholm Harbour.*

* Views 27 and 28.

† On the Elephant Ground a large single rock, being under 7½ feet water, and on the following marks, has lately been discovered: The third mill at Kallundborg, reckoning from the westward, in one with the western side of the little wood at Lerkenborg close to the eastward of Hedevig farm; and the north side of a little clump of trees in Fyen, in one with the north end of Romsö. The beacon has been therefore removed about a cable's length west of the former place, and lies now 20 yards to the northward of the said rock, in 15 feet water. Danske Lods, new edition, p. 442.

only exposed to a little sea with easterly winds, and small craft not drawing more than 5 feet may even avoid that little, by repairing to the innermost part of the bay, where they will be perfectly sheltered; but the holding-ground there is mud, and is not so good, and besides, there is scanty room to veer.

The shallow on the western side of the island extends nearly half a mile from the beach to the northward: and half a cable's length S.E. from the island lies Landlöse Reef, consisting of pebbles and seaweed, dry at low water, only 40 feet across, but nearly a quarter of a mile in length. Close to the north end of this reef there are 3 fathoms water; and to the eastward, the 4 fathoms line is only a cable's length distant from the beach, whereas to the westward it is more than 8 cables' lengths off, and to the southward more than 1¼ miles. This southern part of the shallow is separated from Sletting Flat by a channel with 4 fathoms water, but only 1¼ cables' lengths across; this last-named flat, on which the depth is 17 to 18 feet, extends 2 miles to the southward, and deepens suddenly to 4 fathoms at its southern end.

Landlöse Reef.

Sletting Flat.

The shallow gradually shoalens along the Siælland shore from Reersö to the southward as far as abreast of Sletting Bank, but off a cliff south of Stilling church it juts out to the distance of 1⅝ miles, of which the first cable's length from the beach is foul with rocks, which carry less than 6 feet water. Between this shallow and the Slettings shoal, there is a passage for large ships into Muusholm Bay, and such ships will find it a good roadstead, being three-quarters of a mile wide, and with 6 or 7 fathoms, decreasing to 4 fathoms farther in the bay, between Muusholm and Siælland.

Tiæreby Creek.

To the southward of this projecting flat, between it and Halskov, there is a depth of 4 or 5 fathoms in the bay at the mouth of the creek of Tiæreby.

Halskov Head.

497. Halskov is a projecting peninsula, with a steep cliff, about 60 feet high, and which breaks down, to the south-west, into a low point. From a lonely house here, the Reef-house, the passage across to Knuds Head, on the shore of Fyen, is carried on by open boats, even during severe winters, when the harbours are entirely frozen up, and the Belt encumbered by drift ice. Off the north-east point of the peninsula the shallow extends nearly a mile to the northward, but again narrows

towards the high cliff. From the above-mentioned low point Halskov Reef projects, in a somewhat curved direction, to the W.N.W., and to the distance of 1¼ miles from the point. The inner part of the reef, for 1½ cables' lengths, consists of rocks with from 2 to 6 feet, and then it deepens gradually to 3 fathoms, at 6 cables' lengths off. The outer half of the reef consists of several rocky patches called the Puller, carrying 10 or 12 feet water, and with 23 to 24 feet between them. To warn vessels from the reef, a floating beacon is placed in 5 fathoms, nearly 2 cables' lengths W.N.W. from the middle of the westernmost shoal; its pole is white, with a broom on the top. Close to the eastward of the beacon lies a small patch with 20 feet water. Nyborg church steeple kept open to the southward of Sprogö leads to the southward of the Puller reefs, and the same steeple in one with the Telegraph on Sprogö leads to the northward of them. *Halskov Reef.* *Puller Rocks.*

Vessels coming from the northward ought not to approach Halskov reef within 6 fathoms, and attention is necessary to avoid getting on the back of the reef, if the beacon should be gone. In this case the marks to pass outside of it are, during the day, not to run two hillocks, north-east of Halskov high cliff, in one with the cliff, before being so far to the southward, that the mills to the eastward of Korsör are seen to the southward of the town, when the shoals are passed. Small vessels may stand across the reef, inside the Puller shoals, in 12 feet water, by keeping Ronehöi (a hill covered with copse, and situated at the north end of Korsör Wood), close south of Korsör church. Off the reef there is a flat, with an even depth of 2 to 3 fathoms, extending southward and eastward towards the Reef-house.

A cable's length to the eastward of this house, there is a rocky flat stretching southward for 2 cables' lengths; it is called the Krage Puller, and carries only 9 feet water. When both hillocks on Halskov are in one, and Badstue cliff (south of the town) is in one with Allershöi cliff (lying next to the southward of the former), you are at the south end of the Krage Puller. Between it and the reef of Halskov there is a good anchorage, called the Revkrog, in 14 to 16 feet water, and distant one cable's length from the Reef-house beach, where small vessels may be sheltered in all winds between N.W. and E. A short distance to the westward of the lighthouse there is a *Krage Puller.* *Revkrog Anchorage.*

Lygte Puller. reef called the Lygte Puller, with 8 and 9 feet water, and 1¼ cables in length; this reef is passed by keeping the S.W. edge of Korsör Wood in one with the upper part of a road passing the Badstue and Tornborg Wood to the eastward of the Lygte-bank. From hence to the eastward the water deepens towards *Lygtesand.* the shore, as far as the white sandy flat of Lygtesand, which extends to within half a cable's length of Korsör harbour. To the southward of the inlet to the harbour, at a cable's length *Ertö Shoal.* from the shore, the Ertö Rock has only 3 or 4 feet water. To the southward of the Ertö a foul shallow extends 4 cables' *Badstue Reef.* lengths from the beach; it is called the Badstue Reef, the Spit of which has only 2 or 3 feet over large rocks. The wood on Eiö in one with the western part of the rampart round the fort, or a small hillock on Halskov kept outside of the cliff to the N.W. of the Lygtebank, lead outside of the reef.

Korsör Harbour. 498. To pass north of Ertö into Korsör Harbour, keep Tornborg church in one with a hollow in the wood on Eiö; vessels drawing 11 feet may enter, and will find, with a common water-stand, the same depth in the inner harbour. Being abreast of Halskov, and past the reef, the leading mark for the entrance is, to keep both lighthouses in one, until close to them. These lights at the entrance of the harbour, and also that placed on the *Korsör Lights.* Halskov Lygtebank, are all Fixed; the latter light is visible between the bearings of S.E. by E., round the compass to N.N.E., but the two Korsör Harbour lights from S.E. to N.E.; they are lighted every night, except between the 15th of May and the first of August, during which time they are shown only when the mail is expected. During dark nights, thick weather, or fog, there is besides, on the Lygtebank, lighted an open coal-fire. On account of the strong tide in the mouth of the outer harbour, it is advisable to moor along the quays, where fire and candles on board are allowed.

Korsör Road. The mark for the best anchorage in the outer road is, the lighthouses in one, and a hillock behind the Badstue Reef in one with Badstue cliff; there, the depth is 3½ or 4 fathoms. In the inner road you may anchor in 3 fathoms, between the Lygte Puller and the Lygtesand, with the park of Tornborg in one with the hollow to the right of the Lygtebank, and so far northerly as to have the lighthouses a little open. The anchorage in these roads is good, except with the wind from S. round by

W. to N.W., which produces a bad sea, particularly during the ebb-tide.

In Korsör two skilful pilots are stationed. They are bound to keep brooms on the following shoals:—one on the end of the Badstue reef, one on the Ertö, one on the Lygtepul, and one at the Langpul, as long as the navigation is not encumbered by ice; and for this they have a right to exact from every vessel above the burden of 3 commerce lasts, and not employing a pilot, 4 rbsk. per com. last; such beacon-money, however, is not to exceed 20 rbsk., but it must be paid whether going in or out. *Pilots.*

499. To the southward of Romsö the coast of Fyen, between Staver Head and Rising Head, forms a deep bight called Kierteminde Bay, from the town at its inner end. You may round Staver Head pretty closely, and stand along the northern shore in from 5 to 7 fathoms abreast of the mansions of Hverringe and Brolykke; but off this last, and distant two thirds of a cable's length from the beach, there are some rocks, with 3 or 4 feet water only, while close outside there are 3 fathoms. The south shore of the bay is quite clean, but just outside of the bay lies the Mölle Ground, with a depth of 3 to 4 fathoms. The marks for it are, the two northernmost mills at Kierteminde in one,* and Nyborg church steeple a little outside Juelsberg Wood. *Kierteminde Bay.* *Staver Head.* *Mölle Ground.*

Kierteminde Road offers a good anchorage with the winds from S. round by W. and N. to E.N.E., but easterly winds produce a short and hollow sea, which renders the road somewhat dangerous during the winter, particularly to vessels with hemp cables, as the bottom in some places is foul. The holding-ground, however, is good, and ships provided with stout anchors and chains may long ride there. The best anchorage for small craft is with the church steeple in one with the little spire; and during the summer with Nessenborg, a little lonely house near the beach, in one with the mansion of Lundsgaard, whereas, during the boisterous season, Nessenborg should be kept in one with the grange at Lundsgaard. *Kierteminde Road.*

The harbour of Kierteminde is formed by two piers, between which the tide ebbs and flows with considerable velocity, owing to an extensive sheet of water within, communicating *Kierteminde Harbour.*

* One of these mills is said to be demolished.

with the sea through this estuary. The tide is here pretty regular, but the rise of the flood depends much on the direction of the wind; it is commonly between 1 and 2 feet. With a common waterstand, vessels drawing 8 feet water may cross the bar outside the pier-head at half flood, but it is intended to increase the depth to 9 or 10 feet. In the harbour there are 12 and 13 feet; fire and candles are permitted on board, and a pilot is stationed in the harbour.

Pilot.

500. The coast of Fyen, from Kierteminde to Knuds Head, is clear, and may everywhere be approached within a half mile, or by using the lead, still nearer, the water shoaling gradually towards the beach. A little to the southward of Rising Head, distant 5 cables' lengths from the shore, there is a rocky patch not more than 5 fathoms in extent, which carries 8 feet water, with 18 feet all round; and a little to the northward of the Nordre houses, on the shallow along the shore, there is another small shoal with 8 feet water, and only a cable's length from the beach.

Rising Head. Patches.

501. Knuds Head is a conspicuous cliff, though not very high, forming the extreme point of Osterö peninsula, which incloses, the Nyborg Fiord. To point out the mouth of this fiord there is a Fixed light, which burns every night except from the 1st of August to the 15th of May, but only to serve the mail. Off the cliff there is a short reef, about two-thirds of a cable's length eastward, but the flat reaches 3 cables' lengths to the southward, diminishing in breath, in the direction of Slipshavn Fort, on the low beachy point, which is steep-to.

Knuds Head.

Light.

502. Nyborg Fiord,* branching from the Great Belt towards the town of Nyborg, between Knuds Head and Klöverhage, is 2 or 3 miles in length, and is not only a good roadstead with all winds, but even the largest ships may winter there in security, by mooring in the widest part abreast of the Holkenhavn creek. Knuds Head may be passed without difficulty as far as Slips Point, which is properly the mouth of the fiord, and where several shoals commence on both sides. The course from thence is to be shaped towards Holken Battery till reaching the leading mark up the fiord, viz., the Telegraph to the westward of the town in one with Anes house, a conspicuous little build-

Nyborg Fiord.

* See Plan on Sheet III., Great and Little Belt.

ing close to the beach. This mark leads in a depth of 4 fathoms, with a clay and mud bottom, to the anchorage called the Bredning, abreast of Holkenhavn creek, which is well sheltered against all winds. Farther on, and inside of the Avernakke Shoal, in the bay of the park (Dyrehaven), the same mark leads to the anchorage in the inner road in 2½ fathoms water, clay, and mud. The mark for the best anchorage, there is the eastern chimney on Steensgaard in one with the road leading to the beach, and the westernmost trees on Kalkovn Point (lime-kiln), on towards Avernakke Point, or in the direction of the Strand-gate of the fortress of Nyborg. Vessels drawing as much as 11 feet may run alongside Nyborg pier; two lanterns are lighted there when mails or ferry-vessels are expected during night, and those lights are to be kept in one while in the narrows, inside of Avernakke Point. For further guidance 9 brooms on stakes are placed along the eastern shoals, viz.: 4 at the Lindholm shoals, 1 at the N.W. point of the Steenhöi Shoal, and 4 on the Hav Ground, all of which stand in 10 feet water. On the western side there is only one white buoy, in 12 feet water, off the Hvide Ground, which is the most projecting part of these shoals. Farther on there are two stakes, with bundles of straw, standing on the eastern edge of the Avernakke Shoal, in 10 feet water, and a similar one in 11 feet, on a rock called the Dynen.

Lights shown for the Ferries.

Having thus described the principal entrance, we will proceed with the interior of the fiord. To commence with Slips Havn, a bay just inside Slips Point, and an excellent little harbour with 9 feet water, the opening is pointed out by two stakes with straw bundles, standing in 9 feet water, along the shallow that surrounds the point, and, consequently, to be left on the eastern side on entering; and 4 stakes with brooms, standing likewise in 9 feet water, along the edge of the shallow on the eastern side between Aalehage Point and the head of the harbour. Slips Havn has the advantage of being later frozen up than the interior of the fiord, and has no worms, which is not the case at Nyborg pier. Good water is not to be procured nearer than at a well at Knuds Head lighthouse, that which is found in a well in the neighbouring wood being indifferent. A harbour red light is placed on the rampart at Slips Point; it stands 20 feet above the water, and is seen all round the compass, except between the bearings of W. ¼ N. and S. by W. ¼ W. The Belt dues may be

Slips Havn.

Harbour Light.

cleared in a custom-house office established here for that purpose.

503. On the shallow inside the peninsula of Osterö there are two small islands, Lindholm and Kragholm, which are separated by a narrow channel from the Lindholm shoals and Tungen Spit, where the outermost broom stands with the following marks: the eastern edge of Hessel Wood in one with the western-side of Lindholm Island; and the posthouse on Knuds Head open of Slips Havn Wood. From thence the shoal bends round towards the Steenhöi Reef, and joins it by a narrow ridge that bars the passage between these shoals. The marks for the Steenhöi are, the Salt hills (three small hillocks on Osterö) just coming in one with the north end of Lindholm; and the little spire on Nyborg church in one with the first chimney of the Holmehouse. On the shoals there are only from 2 to 6 feet water; they consist of clay and sand, and the Steenhöi of rocks, of which there are also several on the south end of Lindholm shoals. The channel between these shoals and Lindholm has from 2 to 2½ fathoms water, but it is only 30 fathoms wide in its narrowest part; it is, however, practicable, by keeping a small white turret, standing on the western part of Nyborg ramparts in one with the middle hummock of Ladegaard, a wood to the northward of the Telegraph, or by keeping the house at Slips Havn and the rampart of the battery just open. Farther in are the Ryggen and Dynehöie, hard sandy shoals with 11, 12, and 13 feet water, and to the westward of the Ryggen there is a passage with 15 feet. The rest of the eastern branch of the fiord is clear of any shoals, and the shallow along the shore may be approached within 11 feet water, until off the Havground, which is marked, as mentioned above, by brooms, and on which the depth is only from 1 to 5 feet, with a varying bottom and some rocks.

Lindholm Shoals and Tungen Spit.

Steenhöi. Shoal.

Lindholm Channel.

Havground.

504. The Avernakke shoal, on the western shore, extends nearly 1½ cables' lengths from Avernakke Point, and consists of very large rocks, carrying from 2 to 5 feet. Close to the southward of this reef, in 11 feet water, there is an uncommonly large rock, the Dynen, with only a foot and a half over it, but marked by the outermost straw beacon.

Avernakke Shoal.

Dynen Rock.

To the southward of this rock the bay trends to the westward towards the castle of Holken, where large ships may winter in 20 and 22 feet water without being troubled by the ice, when

Holken Havn.

it starts. Between the mansion and the battery of Holken lies the Slots Ground, a patch of hard sand and rocks, distant only 2 cables' lengths from the shore. *Slots Ground.*

505. Abreast of Slips Point, and nearly midway in the mouth of the fiord, is the Hvide Ground, a bank occupying a large space; it is mostly whitish sand and seaweed, and carries 11 feet water on the shoalest part, where a white buoy is placed. This shoal is insulated by a passage with 3½ fathoms, which separates it from another patch with 9 feet water only, and lying outside the shallow off Keiberg; the passage is narrow and crooked, and, accordingly, difficult to attempt. *Hvide Ground.*

506. Finally, outside of the fiord, in a line between Knuds Head and Klöverhage Point lie the Pale Grounds, the inner and westernmost of which has on the shoalest part 17 feet water, but the Outer Pale Ground is much larger and much more dangerous, for it has only a depth of 12 feet. It is pretended that a passage leads between these shoals with from 3 to 4 fathoms by keeping Nyborg steeple in one with the northern edge of Juelsberg Wood, but the fairest track is to the eastward of the great Pale Ground, which may be avoided, by keeping the grange at Sophienberg in sight to the eastward of Dyrehave Wood; and this mark also clears the Hvide Ground. Vessels drawing 8 feet may pass inside the Pale Grounds, and along the land flat of Fyen, from abreast of Kongshöi spit as far as Avernakke Shoal, with Nyborg Steeple just in one with the east side of Juelsberg Wood; but larger vessels ought to keep the said steeple in one with about a third of the wood reckoning from the eastward, until Sprogö light is a ship's length beyond Knuds Head, which mark clears the south end of the Hvide Ground until the telegraph is in one with Anes House, which, as previously mentioned (Art. 502), leads into Nyborg Fiord, and to the eastward of the Hvide Ground. Vessels may pass to the northward of the Pale Grounds on the mark—five single trees standing inland, in one with the southernmost of two houses at the south end of Keiberg Wood; and to the southward of them in 4 fathoms, with Helvedbakken in one with the northernmost of the two houses. With Helvedbakken touching the southern edge of the wood you will have 20 feet water. The trees are easily discernible, being the only trees standing alone on the high land; and Helvedbakken is the highest peak teminating in a round hummock covered with brushwood. *Pale Grounds.*

Duties and Quarantine. 507. Every merchant vessel passing through the Great Belt is bound to touch at Nyborg or Slips Havn to pay the duties, and to receive pratique, or perform quarantine. In Nyborg there is a slip for the construction of smaller vessels, workmen able to give any assistance required by damaged ships, and plenty of excellent provisions of all sorts, as well as good water.

Pilots. Nyborg is also the chief pilot station in the Great Belt, and the pilots are exclusively privileged to supply with boats those vessels that do not choose to use their own. The beacon-money amounts to 3 rbsk. per com. last to Slips Havn, and 9 rbsk. to Nyborg, for vessels that do not employ a pilot; but vessels belonging to Nyborg, and those that stop there only from contrary winds, pay but half beacon-money.

Nyborg Pier. 508. At the pierhead of Nyborg there are 13 feet water, and along side of it, in the harbour, 12. No vessels are allowed to use fire or candles on board, a cooking-house being erected for their use.

Sprogö Island. 509. Nearly halfway between Halskov and Knuds Head lies the island of Sprogö, with a hill 86 feet high, on which there is a

Sprogö Revolving Light. Revolving light and a telegraph, as well as a house built and fitted for the accommodation of those who are obliged to take shelter there in icy winters. The light is 91 feet above the sea; revolves 4 times in a minute; and may be seen all round within 12 miles.

Sprogö Reef. Off each end of the island there is a reef; the eastern one is 1½ miles in length, and the western one half a mile. The former has, on its shoalest part only 4 feet water, and yet close to its extremity from 6 to 11 fathoms. The ridge of this reef is nearly a cable's length across, and consists of tough clay, mixed with lime and stones, as if it were paved. The reef may be approached by the lead, as on both sides there are flats, that on the north side being the largest; and on these flats the depth suddenly decreases from 3 fathoms, towards the spit of the reef. At a cable's length from the point of the reef, in 6 fathoms water, there is a floating beacon, with a red pole and 2 brooms. The West reef has the same quality of bottom; but off Vesterbierg, the westernmost hill on the island, some large rocks rise above water, on the ridge, which is two-thirds of a cable's length across; the depth on the ridge is from 1 to 1½ fathoms, and towards the extremity 3 fathoms. It is most steep towards the S.E., as there is a flat towards S. and W.; but there are flats all round

the island, on one of which, on the south side, at 1½ miles from the island, there is a spot with only 12 feet water. Another and a more dangerous patch of rocks lies 3½ cables' lengths S. by W. from the lighthouse, where, at low water, there are only 9½ feet on one of the rocks, though between them 2 and 3 fathoms. About 2 cables' lengths W.N.W. from the end of the West reef, a floating beacon rides in 20 feet water, with a white pole and one broom. This West reef ought not to be approached within 4 fathoms. In clear weather the Vresen beacon in one with the western part of Langeland Wood may serve as a mark to clear it. To the westward of the houses on the south side of the island there is a pretty fair shallow, without rocks, and a depth of 2 fathoms close to the beach; but to the eastward, as far as the dry part of the East reef, the ground is very foul, and there vessels should not stand in nearer than into 3 fathoms. The north side may be approached by the lead, as the flat is clean, except to the north-east, where at a cable's length from the beach there are five small rocky patches, inside of which a boat may pass, but not at low water.

510. Several insulated shoals are to be found in the Belt; thus to the north-east, 2 miles from Sprogö, there is a 22-feet spot which may be passed to the westward by keeping Stis Ness Point in one with the eastern side of Eegholm, which is also the leading mark through the channel between Halskov and Sprogö Reefs; but it is too distant to be visible at all times. There are four other little patches of rock about 2 miles S.W. and W.S.W. from Sprogö, with only 18, 19, 21, and 22 feet water, and therefore dangerous to large ships. These shoals are passed to the southward, by keeping Nyborg Telegraph to the southward of the Landport or northern gate of the fortress; the telegraph is a high, white-washed, and conspicuous house at the northern end of the town. Between these four patches, which may be considered as offsets from Sprogö, and another group which seems to be a prolongation of the long range of the Langeland and Vresen shoals and islands, there is a clear channel; the mark for the western limit of which is the telegraph in one with Nyborg church steeple. There are 20 and 22 feet water on this group, and in calm weather a slight rippling of the current shows their position. A ship of the line, whether bound to Nyborg or passing to the westward of Sprogö, ought to take this channel, and never attempt to stand on either

East Channel.

Sprogö Patches.

Vresen Patches. West Channel.

hand beyond the limits of the following notable and conspicuous mark: the telegraph, kept wandering between the steeple of Nyborg church and the Landport or northern gate, and thus affording sufficient room for any ship to work to windward. It is true that a passage, even for the largest ships, may probably exist to the southward of the four Vresen Patches; but between the above marks the most minute search has not discovered a single spot that could arrest their progress like that on which the Danish ship of the line Dronning Maria (Queen Mary) struck in 20 feet water, and which lies on the mark, Vinding church in one with the east end of the house within the ramparts of Slipshavn battery. To the southward of this danger lie the shoals called the Vresen Puller, consisting of several small parcels of rocks, with varying depths; on one of them there are 9 to 10 feet water only, and of course they must be carefully avoided by vessels of all classes. A floating beacon carrying a red ball on a striped pole, is placed at the N.E. Puller in 32 feet water. It lies N.E. from the Puller, with Oxendrup church just open to the northward of Lunde Kohave, and Nyborg Telegraph in one with a gap in Slipshavn wood, reckoning about a fourth part from the southern edge of the wood, and over a small cliff. From hence a N.W. by N. course will clear the spit, on which there are 21 feet water. Moderate-sized vessels may pass them pretty closely to the northward by keeping Nyborg church-steeple in one with the middle of Slipshavn Wood, or more safely in one with the above-mentioned small gap in the trees. Such vessels may likewise pass to the southward of the Puller shoals, between them and Vresen Island, without getting into less than 17 or 18 feet, by keeping Sviuning church a little to the northward of Kohave Grove, a small round wood, bearing E. ¼ S. from the church. This mark, however, is not easily distinguished when coming from the eastward; but a vessel may even work through by standing towards the south-east side of Vresen Island, until the telegraph is in one with the house in Slipshavn battery, or, to be more cautious, until the telegraph is in one with the straw-thatched house outside the battery; and on the other tack towards the Puller, until Nyborg steeple is in one with the south-west edge of Slipshavn Wood. A leading mark between Vresen Island and the Puller, without getting less than 15 feet is, to keep Nyborg steeple a-third of the distance between Slipshavn Wood

Mark for large ships.

Vresen Puller.

Beacon.

and the houses in Slipshavn battery, counted from the wood. During a fog, or thick weather, no vessel ought to approach the Puller within 4½ fathoms water; and during the night, vessels running for Nyborg Fiord ought not to bring Knuds Head light to bear to the northward of N.W. by N.

511. Vresen Island is small, and covered with grass; and to the southward of it there is a dry sand ridge, a quarter of a mile in length, called the Langesand, which continues under water to the southward for 4 cables' lengths, but dries in some places at low water. There is a passage for boats, with 4 to 5 feet water between them, and the whole is surrounded with a gradually-shoaling flat. Eight cables' lengths to the southward of Langesand there is a channel across these shoals, called the Kobber Deep, with a depth of 17 to 18 feet, and for which a good leading mark is Svinning church steeple in one with Telgaard-house, standing about 2 cables' lengths from the beach.* In working through this channel the church may be run a short distance on each side of the house. To the southward of this channel the line of flats extends towards Smörstak Island, a long low narrow cay or holm, and on these flats there are several patches of rocks nearly dry at low water; between them however, there is a channel, the Bose Deep with 11 to 12 feet water, the leading mark being Hesselager church in one with the Stokkebek houses. *Vresen Island.* *Kobber Deep.* *Bose Deep.*

512. From the dry part of the Smörstak a ledge of sand extends to the southward towards Langeland for nearly 3 cables' lengths, and on its end a stake with a broom stands in 7 feet, but with 5 to 6 fathoms close-to. Between this shoal and the Röd Ground, projecting from Langeland, is the Smörstak channel, with 12 to 14 feet water, much frequented by vessels coming from or bound to Svendborg Sound. On its south side, off the northern edge of the Röd Ground, a floating beacon has been placed carrying two brooms on a white pole in 10 feet water, from which the Smörstak stake bears S.W. by W. 3 cables' lengths. The leading mark for this channel is Svinning church in one with Stokkebek houses: another and better mark on the Langeland side is to keep Steengaard mill in one with the grange of Steengaard. In working, the mill may be run to both sides of the grange, and standing to the southward the mill may be run a *Smörstak.* *Channel.* *Beacon.*

* View 29.

short distance to the southward of the grange. The best anchorage here is a cable's length S.W. of the broom in 12 feet water; however, with westerly winds the sea is rather rough in this roadstead.

Röd Ground. From the Smörstak channel the Röd Ground extends about 1½ miles to the southward, and is joined by a flat to the shallow off Langeland: this foul rocky shoal, on which the depth varies from 1 to 21 feet, is nearly a mile wide, and 1½ miles long; the shoalest part being a ridge of a third of a mile in breadth, and carrying from 4 to 6 feet water, which commences about the distance of 3 cables' lengths to the southward of the broom at Smörstak channel, and continues along the eastern side of the shoal until abreast of Steengaard mill.

Smörstak Channel. 513. In taking the Smörstak channel from the southward, the west side of the Röd Ground should not be passed nearer than with the low north point of Langeland, called the Lille Hou, open a degree or two outside of Frank Cliff, commonly called the Great Hou. The better to point out this channel or cut, so particularly valuable to the coasting trade, a floating beacon (a white pole, with 2 brooms) is placed off the north end of the Röd Ground in 9 feet water. N.E. by N., about 2 cables' lengths from this beacon, stands the single broom on the south end of the Smörstak ledge, as already mentioned. Between the Röd Ground and Langeland there is a passage of a third of a mile across, with 4 to 5 fathoms water, until abreast of Nygaard, where it shoalens to 11 feet, which is the depth also on the flat that unites the Röd Ground with the shore. Coming from the northward, keep along the coast of Langeland, at the distance of 1½ cables' lengths, till past Steengaard, when the edge of the light-coloured sandy shallow, projecting about a cable's length from the beach, will be the best guide, as it is to be taken closely, because the deepest water will be found at 80 to 100 feet from the edge of the sand. This being past, and Steengaard being in one with a farm near the beach, good anchorage may be had with all winds in what is called Stoense Harbour, a sort of bay lying between the Röd Ground and the shallow, and serving as a shipping place.

Stoense Harbour.

Langeland. Shallow. To the southward of this bay the shallow along the shore of Langeland becomes wider, with several small reefs of different extent, viz.:—the Skattebölle, Snöde, Egelykke, and Kaarsebölle, besides the Helletofte Spit, all between Stoense Harbour and

Strandby, and all the rocks are overrun by seaweed. Of detached shoals, there is one abreast of Egelykke with 14 feet, and two between Strandby and Päregaard, the northernmost with 17, the other with 19 feet water where shoalest; but as they are less than a mile from the coast, they do not impede navigation.

The bottom here is generally sand and seaweed. On the Päregaard beach, there is a shipping-place.

514. To the southward of the entrance to Nyborg Fiord lie the two Pale Grounds (which have been described in Art. 506), and between which and the shallow along shore there is a $4\frac{1}{2}$ fathoms' channel. Abreast of a hill (Kongshöi) the shallow is foul within a distance of 2 cables' lengths from the beach, and there is a rocky spit called Klöverhage. From thence to the southward the shallow along the coast is narrow, clean, and gradually shoaling towards the beach as far as Hesselager Wood, where a depth of 2 fathoms is found $1\frac{1}{2}$ miles from the shore. Off Else Head, and also off the fisherman's house to the southward of Tidselholt mansion, reefs project a little way, the first having a depth of 4 feet and extending 3 cables' lengths; on the other there is none at the distance of 6 cables' lengths from the shore; for the rest, the bottom is clean sand, or in some places covered with seaweeds. Between this part of the east side of Fyen and the Langeland Shoals, described above, there is a wide channel, with a depth varying between 5 and 10 fathoms. Large vessels, however, have to avoid two insulated flats: the northern one lies abreast of Stokkebek House, and reaches above a mile from the shore, with 2 fathoms water, and is called the Stokkebek Flat. The southern, or Oure Flat, lies between Oure and Smörstak Island, and is also a mile from the shore, with 14 feet water on its shoalest part.

Fyen Shore.

Klöverhage Shallow.

Stokkebek and Oure Flats.

515. The narrow Skaarupöer Sound, separating Fyen from Thorö, is only to be considered as a passage for boats, having, in several places, only 4 to 5 feet water, and being very intricate on account of the points projecting from the shallows on both sides. It is too narrow to allow of working, even for boats, and the current is frequently so strong that a fresh breeze is required to pass it. Nor is the channel pointed out by marks, except at the Skov Mill, where a post has been placed, to which vessels loading can make fast. During the last war, however,

Skaarupöer Sound.

this channel was occasionally used by gun-boats, but always with some difficulty.

Thorö Island and Reef. To the southward of this sound, along the east side of Thorö, the shallow is very narrow, until off the S.E. point of the island, where it runs out three-quarters of a mile in a spit, called Thorö Reef, to the depth of 4 fathoms. At 4 cables' lengths from the point, in 2 fathoms, stands a stake with a large broom, which is the outermost mark, and at which the pilots generally meet vessels bound to Svendborg Sound. The spit consists of fine sand and shells.

Only two pilots are stationed there, and though they are seldom employed, except by foreigners, yet as it might happen that both pilots may be absent, the seaman should know that in order to avoid the south side of the spit he must keep Bregninge church (on the island of Taasing) in one with the castle, and stand on until, approaching the castle, he will perceive a stake with a bundle of straw, which points out a patch with 9 feet water. In case of not meeting a pilot there, it is advisable to anchor, if not acquainted with the localities; the holding-ground being good, and the anchorage being nearly landlocked.

Svendborg Sound, Eastern Channel. 516. The eastern channel into Svendborg Sound is so winding as to be all pilot water, though fully marked by beacon-stakes; those along the northern side carrying brooms, and on the opposite side bundles of straw. Vessels not taking a pilot pay a fee of 3 rbsk. per com. last, beacon-money; but those belonging to Svendborg custom district pay only 1 rbsk. per com. last.

The channel in many places is so narrow that dull-sailing vessels require a fresh breeze to work in against a contrary current, which is sometimes considerable, for regular tides exist only during settled weather. The water rises when the stream runs in from the eastward, and falls when it sets out; and the general waterstand therefore varies much in different parts of the sound. Though the depth is everywhere convenient for anchoring, yet vessels always try to reach some place out of the stream, such as Eeg Havn, at the eastern side of Taasing, where in the road there is excellent holding-ground, in 2 or 2½ fathoms; or at the town of Svendborg, where a hawser may be run to one of the posts; or at Yholm in the western part of the Sound,—of which, hereafter. In several places ship-building is

going on briskly, as at Troense, Svendborg, and Thorö Bund, a deep creek in the island of Thorö; and at each of them vessels may be hove down, repaired, and provided with everything necessary. There is a pier at Troense, 55 yards long, with 6½ feet water at the pier-head. *Troense.*

About S. by W. 5 cables' lengths from the Stamping mill to the eastward of Svendborg, lies a shoal, which is shown on the chart, with a depth of 17 feet; but from it rises a small rocky patch about 6 yards across under 10 feet at an ordinary low-water stand, but 3 to 4 feet less with westerly winds. The mark for the shoalest part is, Hulemose mill midway between the western and the middle chimney of Biörnemose farm; and the elevated mill at Svendborg a little open outside the point of Taasing. With the mill in one with the straw beacon off the point, you will have 14 feet water, and a little farther out, on the very edge of the shoal, 17 feet.

Outside of Svendborg Sound the shore of Taasing forms a deep bay called Lenke Vig; but not being a shipping place, it is not frequented as an anchorage, though well sheltered. The shallow along the shores of this bay is very wide, and vessels must there keep midchannel, and pay due attention to the lead. The peninsula of Vemmenæs, which forms the eastern shore of this bay, has off its north-east point a small reef extending a cable's length to the N.E.; and from Stener Point the shallow, after rounding the shore at the distance of 3 or 4 cables' lengths, stretches across to the Ness, on the opposite shore of Langeland. *Lenke Vig.*

517. The channel to Rudkiöbing crosses this flat, between the Middel and the Revbierg Grounds, to the eastward; and on the western side the Navers and Siö Grounds.* It is narrow and crooked, but marked by poles carrying white flags on the side next Langeland, and black flags on the Taasing side; the beacon abreast of Siö Sound having two black flags. But as it frequently happens that these poles are either run down or carried away by the current, it is necessary to state here the mark for those who are unacquainted with the locality, and who have not procured a pilot. Coming from the northward and bound to Rudkiöbing, the course is S.S.W. until the village Troense is in one with Stener Point about N.N.W.; Faareveile Wood in one with the east end of the small island of Siö; and the third mill to the northward of *Rudkiöbing.* *Rudkiöbing Channel.*

* See Entrance to the Baltic, Sheet IV., Kiel Bay.

Rudkiöbing in one with a yellow cliff near the beach; thus leaving the outermost stick on the port hand. The course is then S.W., keeping the whole of the village on the island of Strynö a little open to the westward of the house on Siö, until Cimmerbölle church is in one with two houses near the beach of Revbierg, the space between the houses appearing like a road; on which mark you are then to keep until two mills to the eastward of the town are in one with a large whitewashed stone on the beach, some distance north of Rudkiöbing; but observe that a little opening should be seen between the mills and the stone, or, in other words, the southern mill only must be run in one with the stone. Continue in this mark till Strynö church is in one with the Barnesteen, a large rock about 30 fathoms from the S.E. beach of Siö; and on this mark then steer until Rudkiöbing church approaches two chimneys on a high house to the eastward of the church, which chimneys may be distinguished by their appearing like one when seen in the direction of the church. This last mark is then to be followed until a hillock near Faareveile Wood is in one with the cliff to the southward of Rudkiöbing, on which a lime-kiln stands. This mark leads past the harbour, close to the southward of which will be found the best anchorage. It is to be remembered that on the Revbierg Ground, in 9 feet water, and a little to the westward of the 3rd and 4th white flags, there is a rock with only 5 feet water. The depth of this inlet decreases from 3 fathoms to 8 feet, and abreast of Rudkiöbing it is scarcely a third of a cable's length wide; so that it is very difficult to work through, even for fast-sailing vessels, against the current which generally runs at the rate of 1 or 2 knots during settled weather.

Middel Ground.

518. Halfway between the south-east part of Vemmenæs and Langbierg (a hill on Langeland), lies the Middel Ground, a sandy shoal with from 7 to 11 feet, extending E. and W. nearly a mile, but N and S. only a little more than 2 cables' lengths. At the west end of this shoal is a pole and broom in 2 fathoms.

Off the Ness the shallow along the Langeland shore is only a third of a cable's length wide, within the depth of one fathom; but from thence it enlarges until, abreast of Revbierg, it reaches out almost a mile, and then curves round towards the pierhead at Rudkiöbing. This part of the shoal is called the Revbierg Ground, and is rocky on its southern edge.

Revbierg Ground.

519. Off the south-east point of Vemmenæs, in the direction of

the Revbierg Ground, there is a neck of sand carrying less than a fathom water to the distance of half amile from the point: it is called the Navers Ground; between it and Revbierg Ground the Rudkiöbing channel passes, and with the shallows that surround the island of Siö it forms Siö Sound, a long shallow bay stretching to the westward towards Rallen Cays, off Taasing. *Navers Ground.* *Siö Sound.*

520. On the eastern side of Siö, the shallow does not project much more than a cable's length from the beach, but off the north-east point there is a spit of sand nearly 3 cables in length; and again, to the southward of the same island, the rocky tail of the shallow runs out to the distance of 7 cables' lengths. *Siö Shoals.*

521. At Rudkiöbing the northern pier of the harbour is straight, but the southern bends in so as to narrow the entrance. Inside the old harbour to the southward of the pier, the general depth is from 9 to 11 feet, and never less than 7, which occurs only with a S.W. gale; at the entrance of the new harbour, to the northward of the pier, the depth is from 7 to 8 feet and 5 to 6 feet within; however, it is intended to be dredged to a depth of 10 feet. But to preserve those depths constant dredging is necessary, for both southerly and westerly gales throw in sand and seaweed. Outside the harbour, in 2 fathoms, there are two warping buoys. The beacon-money is 3 rbsk. per com. last, whether coming or going. Vessels using a pilot do not pay beacon-money, and those belonging to the town pay only 2 rbsk. per com. last; but for anchoring in Siö Sound they pay but 1½ rbsk. per com. last. Neither fire nor candles are allowed on board in this harbour. *Rudkiöbing Harbour.*

522. To the southward of Rudkiöbing the channel continues narrow and shallow, but duly pointed out by marks like those in the northern part of the inlet, until abreast of Kragholm, where it becomes wider. The mark is then to bring a small lime-house, situated south of Rudkiöbing, in one with the west side of the church; and the working marks are Ristinge village in one with the low projecting shore of Langeland on the eastern side of the channel; and on the western side Strynö church in one with a yellowish cliff on the north-eastern shoulder of Strynö Island. The greatest depth will be only 8½ to 9 feet; but anchorage may be found everywhere, though on account of the current it will be imprudent to anchor in the narrows.

523. A little more than 2 miles to the southward of Rudkiöbing there is a large and excellent-looking bay called the Noret, *Noret Bay.*

which formerly served for a winter harbour. The entrance, in which there are from 2 to 3 fathoms water, lies between two sandy shallows, the northernmost extending 4½ and the southernmost 5½ cables' lengths from the shore; but on the latter there are some rocks. The best place in this bay is to the westward of the small holms Kamese, Eegholm, and Næstholm, which lie in the entrance of Henninge Harbour. The depth there varies from 11 to 6 feet, and in the middle of the harbour are still standing a range of poles to make fast to. A neck of land separates the harbour from another which is deeper, but which is somewhat open to southerly gales.

Henninge Harbour.

Between the small holms in the southern part of this sheet of water, the Noret is just sufficiently deep for small craft.

To the southward of the Noret the shallow is only half a cable's length wide, but off Ristinge it extends half a mile from the shore, and, veering suddenly towards the N.W., forms the shallow sandy ridge called Langö Sand, which stretches half a mile to the northward of Langholm Head, and round which lies the entrance to Marstal in the island of Ærö, of which hereafter.

Ristinge Pier. From Ristinge a ferry crosses to Ærö, and as it is also a shipping place, a stone pier, about 200 feet long, has been erected there, with a pierhead 35 feet wide, along which there are 3 or 4 feet water. To run for the anchorage there, steer directly for Ristinge until a large tree becomes visible to the westward of the village, and till the Ram-houses in the bay east of Ristinge are in one with Hesselbierg mill, then steer on this mark until Ristinge village is in one with the little hill of Rams Höi at the new pier, where the anchor may be dropped in 10 or 12 feet water, and 2 cables' lengths from the pier.

524. The shallow to the southward of Siö turns to the westward from the rocky tail mentioned in Art. 520, towards the Rallen Cays, from thence it again trends to the southward and forms a very extensive bank called the south Sælgrund (Sealground), and finally it again turns to the westward with several sinuosities up to Vorre Knude (Knoll,) the south-west point of Taasing. The depth on the whole of this extensive bank is less than a fathom, with many rocks, and is called the Taasing Ground or Tose Shoal.

South Sealground.

Tose Shoal.

In the S.E. bight of this great shallow, and a cable's length N.E. of the South Sealground, there is a rocky patch with 4 to 5 feet water called the North Sealground.

North Sealground. Strynö.

The islands of Strynö and Birkholm, with several smaller holms or cays and heaps of rocks, are all surrounded by a large and very shallow flat that is separated from the Taasing Ground by a channel called the Knude Deep, at the western end of which there is a depth of 2 to 3 fathoms, but only 7 to 8 feet on the wide bar that unites the Strynö Flat with the Taasing Ground, and thus closes the inlet to all but small craft. This Knude Deep, as likewise the Mörke Deep along the south-west side of Strynö Flat, will be described hereafter. On the south and east sides of the flat, between the islands of Langeland, Strynö, and Ærö, there is a spacious and clear sheet of water, with a depth of 2 to 3 fathoms, and offering a free passage from Rudkiöbing to Marstal, and to the Mörke Deep. There is, however, in the way one insulated shoal, the Meyer Ground: it lies between Langholm and Greenholm, and carries but 9 feet water. *Knude Deep.* *Meyer Ground.*

The course to be steered in passing Strynö is S.W. until two remarkable farms are visible to the southward of Marstal church, as this mark clears the southern tail of Strynö Flat. From thence to Marstal the best mark is Halmö houses open of Halmö Cliff, which leads between Langö Sand and Meyer Ground.

525. We shall now return to the northern end of Langeland,* where, about a cable's length to the southward of Frank Cliff, there is an anchorage in 4 or 5 fathoms, good holding-ground, but the sea is rather rough with all winds from S.W. round to N.N.E. Off Lohals vessels seldom anchor, unless to take in a cargo; but at a short distance to the southward of it there is a good berth in a depth of 2 or $2\frac{1}{2}$ fathoms near the beach. *Frank Cliff.* *Lohals.*

From Frank Cliff an extensive flat runs out north and east; the distance to the 4-fathoms water line is above a mile and a half, and the flat is called the Hou Sand. Inside the depth of 8 feet this shallow is foul, but outside of 10 feet water there are no rocks, and accordingly this flat affords a convenient anchorage with remarkably good holding-ground: it is much frequented by vessels meeting with southerly winds and contrary currents, which are so common in the Belt. Coming from the southward through the Smörstak Channel, and being bound to the eastward, Hou Sand may be passed in any required depth by using the lead; or to round it in 12 to 15 feet, keep Charlotten- *Hou Sand.* *Marks.*

* See Entrance to the Baltic, Sheets III. and IV.

lund, a house covered with red tiles a mile south of Frank Cliff, open outside that cliff, until Nyborg church steeple is in one with the highest hummock on Vresen Island, when the course may be shaped to the eastward. Smaller vessels may stand across the sand in 10 feet, when Hesselager church is shut in a little on the north end of Svinninge Kohave, a wood behind that church.

Broen Flat. 526. To the eastward of the Hou Sand, in the direction of Agersö Island, there is a flat, on which the depth varies from 4 to 7 fathoms: this is called the Broen (Bridge), because it stretches across the Belt nearly two-thirds of its breadth, and within a mile of the Vengeance shoal, which consists of several rocky patches with only 19 to 22 feet; but 4 to 5 fathoms close round and between them, and at a little distance the water gradually deepens to 7 fathoms. This shoal, so dangerous to large ships, may be discerned when the water is smooth, by the rippling of the current over its shallow spots.

Vengeance Shoal.

A safe mark to pass to the eastward of the Vengeance is to keep Korsör castle tower in one with the telegraph on Korsör church; and to the westward to bring Nyborg church in one with Slipshavn Wood about a third of the length of the wood from its north end. But these objects not being visible at all times, the following marks may serve: Boeslund church kept the same distance to the northward of the north end of the small island of Eegholm, as the lofty wood on that island is to the southward of the point, will lead to the northward of the Vengeance: and the same church in one with that point, about E.N.E., clears the shoal to the southward. Finally, the shoal is passed to the westward by keeping Omö church and a small copse on the same island a little asunder.

Badstue Reef. 527. In the description of Korsör (Art. 497), Badstue Reef was mentioned as projecting to the south side, but from thence along the coast to the southward, as far as Alleshöi, the ground is foul and rocky, but to no great distance from the shore. Off Lindeskov Flat, which stretches out 3 quarters of a mile, there is an insulated flat carrying 2 fathoms water, and 5 cables in length; but inside of this flat a passage will be found with a depth of 5 to 6 fathoms. The west side of the Flat may be approached until in 16 feet water, minding not to keep farther to the eastward than to have the eastern edge of Ornehoved

Lindeskov Flat.

Wood, to the northward of Stis Ness, in one with the western edge of Tudse Point Cliff. This Lindeskov Flat may be said to form the eastern side of the entrance to Agersö Sound, between Siælland and the small islands of Agersö and Eegholm.

528. Farther to the southward lies Skielskör Fiord,* but the entrance between its sandy flats is too narrow to work through. *Skielskör Fiord.* The western flat projects from Tudse Hage, its southern point, *Tudse Point.* 6 cables' lengths; and the inner part is full of rocks, which dry at low water to half that distance. Skielskör Road is well *Skielskör Road.* sheltered, except from N. by W., to W.N.W.; but the holding-ground is good.

In the narrow inlet, a patch 30 fathoms long is kept down by dredging to 8 feet, and the same depth is found along the Vasebro, a sort of wharf; just inside the mouth of the fiord *Vasebro Pier.* but farther in, it deepens to 11 or 12 feet. To lead into this narrow channel there are two beacons, which are to be kept in *Beacons.* one; the innermost of them is the tallest, and the other carries a cross-tree. The pilot lives close to the entrance, in a conspi- *Pilot.* cuous little house at the hill, named Rensebierg. Fire and candles are allowed on board. The beacon-money, 8 rbsk. per com. last, is paid alike in coming and going. Vessels only stopping, without loading or unloading, pay 4 rbsk., and those belonging to the town only one half, in both cases.

To the southward of Tudse Hage, or Point, the shallow off the beach forms a large flat, called the Koopen, and here will be found the best anchorage in Agersö Sound, being well sheltered *Agersö Sound.* in all winds, good holding-ground, and a depth of 2 to 3 fathoms, between the following marks: Boeslund church visible a little inside of, to a ship's length open of Tudse Point; Skielskör church, between two hillocks to the westward of it, and the church just open to the southward of the southernmost hillock; Magleby church will then be in one with the north side of Borreby castle.

529. If bound to the southward, from thence you may pass over the flat extending off the point at Ornehoved Wood, by keeping Boeslund church in one with Tudse Point, until a conspicuous white house (the school) is just open of the north end of Ornehoved Wood; you will then be abreast of the edge

* See The Baltic, Sheet I., Femern to Bornholm.

of an extensive rocky reef called the Teskel, stretching off from the point, and may steer a more southerly course along the shore-flat which is narrow, so that a depth of 3 fathoms is found at the distance of three-quarters of a cable's length from the beach as far as Stis Ness, which point may be considered as forming the southern mouth of Agersö Sound. No leading mark serves for the passage of this sound; but with a leading wind keep mid-channel, and if working, attend to the lead, which will give sufficient warning of the shallows on either side, though in some places nearly a mile wide to the northward of Stis Ness. In working through the northern part of the Sound, Boeslund church open to the westward of the north-western farm on Tudse Point will clear the Teskel. Stis Ness itself is tolerably bold, but to the southward of it the shallow again expands to 6 or 7 cables' lengths. The shallows in the Sound are widest on the Agersö side, to the southward of the village; but on the Siælland side their greatest breadth is to the northward of Stis Ness Wood. Mid-channel the depth is more than 20 fathoms.

Stis Ness.

Helleholm. Flat.

Off the peninsula of Helleholm, at the south end of Agersö, there is a large flat, extending to the south-eastward above 2 miles; but, at three-quarters of a mile from the island, the flat may be crossed in 2¼ fathoms, by keeping Magleby church in one with the eastern cliff of Stis Ness; or in 2 to 2¼ fathoms with Boeslund church in one with the eastern edge of Ornehoved Wood. Nearer than on this mark no vessel ought to come, as inside of it the bottom is foul. On the outer part of the flat vessels may anchor as a stopping-place; the bottom, however, is too soft to be good holding-ground, and a S.E. wind produces a rough sea. Another and a better anchorage is in Bögevig,* the bight between Agersö and Eegholm; and when going in there you may run past the south-east point of Eegholm, until two bushes, on the south side of the island, are seen apart; and having then the second of the north-west mills at Korsör in one with the above-mentioned point, the anchor may be dropped in 10 to 12 feet water; but the ground there is softer than at Koopen, and, moreover, the anchorage is less safe, as a S.S.E. wind produces some sea. The marks for the stopping-place generally used by vessels loading is, the alley which leads up

Bögevig.

* See Entrance to the Baltic, Sheet III., Great and Little Belt.

to the village, open; and the north-western mill at Korsör a vessel's breadth inside (to the westward) of the east end of Eegholm Island. However, the best anchorage on the flat is the Mölle deep, to the eastward of Helleholm, on tough holding-ground, a compound of mud and sand, close to the southward of the shallow spit, and which may be reached by keeping Helleholm mill in one with the third bush (reckoning from the southward) in the garden of the farm; and when the battery on the point to the northward of Stis Ness is visible midway between the woody point and Boeslund church, you may anchor in 14 feet water.

530. The flat surrounding Agersö and Eegholm extends 2 miles north of Eegholm; to the north-west more than 2; and to the westward about 2 miles, with a depth of 2 and 3 fathoms, clean sandy bottom; whereas west of Agersö it is only a mile wide. West 1½ miles from the south end of Agersö there is a detached flat three-quarters of a mile long, and somewhat more than 2 cables' lengths wide. On this flat the greatest depth is 3 fathoms, and the least on a small rocky patch, only 12½ feet; the latter lies with Boeslund church in one with the northern edge of the grove on Agersö; and Helleholm mill its own breadth inside a small copse close to the northward of the day mark on Helleholm: all these shoals should be avoided by large ships working between the islands and the Vengeance shoal. *Eegholm Flat.*

531. Agersö is separated from Omö by the deep-water channel called Omö Sound, the narrowest part of which between the shallows is a little less than 4 cables' lengths across, and 20 fathoms deep; but with a very strong current, and remarkable by its changing every six hours, though on the surrounding flat the stream remains unaltered. The Agersö shore in this Sound is bold, and ought to be passed at the distance of 1½ or at most 2 cables' lengths, on account of the flat which spreads out from the north and north-west sides of Omö, with only 10 feet at half a mile from that island, and 5 feet closer in, and which from its steepness is difficult to approach by the lead. In entering the Sound this flat is to be carefully avoided, not only from its shallowness, but because it is very foul, some of its rocks barely covering at low water. You pass to the westward of this flat by keeping Korsör Wood open to the westward of Eegholm *Omö Sound.* *Omö Flat.*

Wood, and likewise by keeping Omö church to the westward of some small shrubs on the beach of the north-west side of the island.

Beacons. Two floating beacons mark this dangerous flat—one on its edge, in 3½ fathoms, with a white pole carrying two brooms; and one to the eastward off the rocky patch in 9 feet water, with a white pole and one broom.

Helleholm Light and Beacon. 532. To lead through Omö Sound, a Red light is shown on a 25-feet pole at night; and as a day mark, a three-feet ball, painted red and white, above the lantern. When entering the Sound, from the westward, this ball is to be kept in one with the mill on Helleholm.

In entering Omö Sound from the southward, keep a conspicuous rampart on the S.W. side of Agersö visible between two detached houses to the northward of the rampart: these houses stand near each other, and the easternmost is surrounded by trees. On this mark you may steer midway between Omö N.E. reef, and Helleholm until on the above leading mark from the westward, viz., the day mark in one with the mill on Helleholm, which mark will lead out of the Sound.

533. At the east side of Omö there is good anchorage, with southerly, westerly, and northerly winds, in 3 to 4 fathoms, distant 2 or 3 cables' lengths from the shore, with the village well open of the cliff on the east side of the island. During easterly winds the sea there is however rough; but on this side, as well as on the other, the sandy shallow off the island gradually shoals so as to be approached by the lead. This is not the case to the

Omö Tofte. southward, as there, a narrow ridge, called Omö Tofte, projects to a distance of more than 3 miles from the island, with only 2 feet water in some places; but between this shoal part and the

Eleven-feet Channel. south end of Omö there is a channel with 11 feet water, and more than a mile wide. It is commonly frequented by the coasters passing between the north end of Langeland and Grön Sound, or the Bögeström channel, partly because the distance is shorter, and partly to avoid the strong current in Omö Sound. On the north side of this channel there are some rocks, carrying only 5 feet water, and bearing S.E. from the south point of the island; to avoid them Holkenhavn Wood (in Fyen) is to be brought to the southward of Omö, before Boeslund church comes in one with the high east point of that island. This

channel is so wide that it may be passed by estimating the distance from the island; but the mark for the deepest water in 11 feet is, Rygaard (in Fyen), in one with the north end of Hou Wood on Langeland. Rygaard, however, being difficult to distinguish, another more conspicuous, though equally distant, mark may serve, viz., to keep the south end of Svinninge Kohave (a wood close to the southward of Svinninge church in Fyen), in one with the hollow in Hou Wood, which appears inside of three or four single trees standing on Frank Cliff. The general way of crossing the Omö Tofte is, when abreast of the south point of Omö, to steer E.S.E. until the water deepens to 3 or 4 fathoms; or until the village on Agersö comes open to the eastward of Omö. As a guide across the Omö Tofte, a floating beacon, with a white pole and one broom, *Beacon.* is placed in 9 feet water, about half way between the south point of Omö and the north end of the shoalest part of the Tofte. At this beacon Korsör church is visible well open to the eastward of Omö church.

Coasters working along the shore of Siælland, on being *Basnæs Harbour.* desirous to enter Basnæs harbour within the shoal of Sævedö, have to avoid a large rock with less than 2 feet water on it, rising from a depth of 8 feet, on the following marks: Rude mill touching the south end of Basnæs eastern wood, and Transby farm kept to the westward of the outermost copse on the point S.W. of Basnæs.* The inlet to the harbour is to the northward of the rock in an easterly direction, with the ice-cellar house (a small white-washed house close to the westward of Holsteinborg castle) in one with the south end of Basnæs eastern wood: on this mark you will have a depth of 8 to 9 feet, until near the east point of Sævedö spit, which is distinctly visible by the bright hue of the water. The spit may be approached closely, and rounded in a northerly direction; and when Magleby church is in one with the west end of the copse, to the westward of Basnæs, the anchor may be dropped in 6½ to 7 feet water, soft bottom covered by seaweed; this depth will be found over an extensive part of the harbour. In the inlet the bottom is hard.

534. To the southward of Omö Tofte lie the Staal Grounds, *Staal Grounds.*

* Neither this rock nor the objects given as marks for clearing it are shown on the Danish Chart.

two detached shoals with 10 to 11 feet water, and surrounded by an extensive flat, with several patches of 3 to 4 fathoms, which of course are dangerous only to large ships that attempt to pass between them and the shallows of the island of Laaland. This passage, however, is particularly difficult, because there are no visible leading marks; and the true position of the ship, or the course to steer, can be inferred only by distant cross-bearings: it will, however, be some guide to know, that Utterslöv church in one with the eastern edge of Vintersborg Wood (both on Laaland) lead on the south end of the western Staal Ground. On this mark, and on the southern point of the shallow in 10 feet water, there is a floating beacon, in 13 feet, carrying a striped pole and a red ball.

Beacon.

Though the channel between the Staal Grounds and the Omö Tofte would admit ships of any size, a glance at the chart will be enough to show that it ought not to be attempted by any vessel drawing more than 10 feet, except under very urgent circumstances.

Shallows east of Stis Ness.

535. The Shallow along the coast from Stis Ness,* and eastward to the island of Glænö, widens to the breadth of 1½ miles from the shore, before the depth of 4 fathoms is attained; but as it gradually shoals, it may be approached by the lead. Between it and the flats of Omö and of Omö Tofte lies an open space, with 7 to 8 fathoms water; the only shoal being the Kirke Ground, which will be mentioned in the description of the smaller islands.

Laaland.

536. The whole of the shallow along the shores of the island of Laaland, from the Staal Deep round the Bielke Head and Taars Point, is also of considerable breadth, but it may be everywhere approached by the lead.

Ohnse Vig

Off Ohnse Vig, a deep creek on the north-west side of Laaland, there is a rock, with 2 feet water, and 9 feet around it, and the marks for it are, a solitary house on the east point in one with a remarkable hummock in the wood. It is passed to the northward at the distance of 40 feet, and in 8 feet water, when that hummock in the wood is visible to the westward of the house: to the eastward when the road in the wood is open to the view, and to the westward when the low point, marked by four houses, is in one with a hollow in the wood.

* See The Baltic, Sheet I.; and Entrance to the Baltic, Sheet IV.

537. On the narrow island of Vensholm, off the N.W. end of Laaland, there was formerly a light for the use of the steam-packets, during certain hours on fixed nights, but it exists no longer. The island is, at its eastern end, joined to Laaland by a shallow, with 2 to 4 feet water; and to the northward and westward it is surrounded by a shallow with very little water to the distance of a mile to seaward, the inner part being almost dry. A nearly dry sand-reef projects from its S.W. end likewise, in the direction of the coast of Laaland, to the distance of about a mile from the point, and thus forms the narrow Vensholm Sound, into which small craft, drawing 6 feet, may enter from the southward, and lie well sheltered against all winds abreast of the south point. To pass to the southward of the reef, bring the mansion of Frederiksdal to bear S.E. by S., nothing southerly, and steer in this direction until an opening between the north end of Vensholm and the point of Laaland, to the northward of the island, just becomes visible; on this mark then steer E.N.E. on the inside of the reef. The inlet has at the end of the reef a bar, with only 6 to 7 feet water, and inside of this, along the Laaland shore, there is a narrow channel with 16 feet, but decreasing inside of Vensholm to 6 and 7 feet, mud and seaweed. *Vensholm.* *Vensholm Sound.*

Small craft may find shelter to the northward of Vensholm, in a narrow inlet with 2 fathoms water inside the north-west flat of the island: in order to run for this inlet, keep Snöde church on Langeland in one with the eastern side of Kars Wood,* and when off Vensholm, steer S.S.W. round the north and east sides of the flat.

538. Between Vensholm and Taars the shallow is irregular, with shoal ridges of sand one to two-thirds of a mile off shore; and W.N.W. ½ W. two-thirds of a mile from Taars there is a long sandbank, on the shoalest part of which are only 6 feet water, whereas inside the shoal 13 to 15 feet will be found by keeping Kappel church just open to the westward of Enerhöi. Coming from the northward these objects are to be kept a little asunder, until Nakskov church is visible outside of the ferry-pier at Taars; then you are at the north end of the bank, and in order to pass to the eastward of it, Kappel church is to be brought close to the west side of Enerhöi, which leads into 13 feet, until arriving on the mark for the entrance to Taars.

* Sheet III.

Taars. 539. At Taars there is a ferry to Spodsbierg on the Langeland shore, and between Taars and Albue Point lies the large fiord

Nakskov Fiord. of Nakskov, piercing deeply into the island of Laaland. Abreast of Taars the 4 fathoms water-line is more than 2 miles, and abreast of Albue more than 1½ from the shore, the whole of the fiord of Nakskov and all its different channels being very shallow, and only admitting vessels drawing 9 to 10 feet up to the town of Nakskov. It is said that the channel to the town is to be dredged out, so as to admit vessels drawing 12 feet.

Albue Ledges. 540. Outside the mouth of this fiord, the only dangerous shoals are the Albue Trillers, or ledges of sand, with 5 to 6 feet water, lying a little to the southward of the houses on Albue Peninsula; they extend nearly 6 cables' lengths off shore, and are steep from 4 fathoms. Therefore, coming from the southward, do not stand into 4 fathoms before the two largest houses on Albue are in one, when you may approach the point. A floating beacon is placed in 22 feet to the westward of the shoal, carrying a broom

Enerhöi Island. upon a white pole. The island of Enerhöi, in the mouth of the fiord, extends nearly 2½ miles, and is surrounded by shoals which stretch across the fiord, viz.—the Rÿggen, the Hvide Ground, the Biörne, and the Knöll.

Ryggen Shoal. 541. The Ryggen is nearest to Albue Point, and fully 3 cables' lengths from the shore; it is more than 8 cables' lengths from N.W. to S.E., and its least depth is 8 feet.

Inside of these shoals, and distant only 4½ cables' lengths west

Knoll. of Enerhöi, is the Knoll, a small rocky bank, on which the least water is 3 feet.

Hvide Ground. 542. Hvide Ground is a very large and shallow shoal close to the northward of Enerhöi, and a third of a mile from the Ryggen; it has only 2 feet water on its shoalest part.

Biörne Ground. To the northward of this shoal lies the Biörne Ground, the shallow part of which, carrying only 5 feet, is 2½ cables' lengths wide each way.

Keeping the little house on Albue midway between the two larger pilots' houses, leads to the westward of the shoalest part of the Hvide and Biörne Grounds, in a depth varying between 13 and 18 feet.

Taars Road. 543. Taars Road is between the northern shore of the fiord and Biörne Ground, and to run for it from the Belt, bring Sandby church in one with a remarkable row of willows stand-

ing near the beach, to the eastward of Taars' Ferry-house: keep on this mark until the pier at the ferry-house bears N.N.E., and then drop the anchor in 12 or 13 feet water. A more conspicuous mark is, to keep the southernmost house in Taars' village in one with the outer end of the ferry pier. The house is a new one, with a tilted roof. When working in, Sandby church may be run on both sides of this row of willows.

Small craft, drawing less than 5½ feet, may proceed from Taars Road into Nakskov Fiord by keeping Langö village in one with the west side of Enerhöi Island, until the house on Rommerholm is in one with the north end of the wood on the island of Store Veilö. Then steer on that mark until the eastern pilot-house on Albue is in one with the north end of Enerhöi, and again on this mark until Nakskov church is close to the northward of the house on Lille Veilö; and finally, on this latter mark until Kappel church is in one with the house on the island Bogö, when you may enter the fiord to the westward and northward of the island of Slötö. *Nakskov Fiord.*

544. To run into Albue Road, between the Albue shore and the Ryggen shoal, bring the northern edge of the wood on Store Veilö in one with the battery on the south end of Enerhöi, until the southern little pilot-house on Albue is visible to the eastward of the eastern and larger pilot-house; then the north end of Veilö Wood is to be run in one with the south end of Enerhöi, and this mark to be then steered until the west end of the island of Langö is in one with the south-east point of the Albue shore. Let go the anchor there in 15 feet water. In entering, you must avoid a wreck in the entrance, lying in 3 fathoms water, more than a cable's length from the shore, and on the stem of which there are but 5 feet water, with a stake and one broom. The common track is to the northward of this wreck, and you are past it when the little pilot-house comes to the eastward of the larger one on Albue. In Albue Road the bottom is sand, mixed with clay under soft mud and seaweed; and if vessels have anchors weighty enough to sink through the mud, the holding-ground is good, and the road is well sheltered, except against the winds from N.N.W. to W., which occasion some sea, particularly when the current runs out; but vessels drawing between 6 and 12 feet, and provided with good ground-tackle, may well ride out a gale there. In the bay, on the *Albue Road.* *Wreck.* *Albue Harbour.*

eastern side of the Albue shore, vessels drawing 7 to 8 feet may find a safe harbour with all winds. To enter this harbour from the Road, you must round the S.E. point of Albue at the distance of only 50 yards, and run in W.N.W. as far as the draught of the vessel will allow.

From the northward, the shallow along the coast of Laaland may be approached to 18 and 16 feet, by keeping the southern little pilot-house on Albue visible midway between the two large and northern pilot-houses, until on the above leading mark for the entrance to Albue Road. For vessels working in the Belt, this is a good turning mark.

Nakskov. 545. If bound from Albue Road up the fiord to Nakskov, the church of that town is to be brought in one with the battery on the south end of Enerhöi Island, until at the distance of about 3 cables' lengths from the point, when the vessel must edge to the southward, so as to bring the church steeple in one with the southern point of Enerhöi, where there is a stake and broom, which, as well as the next one, standing on the shallow off Enerhöi, are to be left on the port side.* From the south point of Enerhöi, the channel in this fiord is pointed out by brooms; it first trends northerly towards Rommerholm; and as the marks or brooms are all on the edge of the Rasö Ground, they are, of course, to be left on the starboard side; the channel then bends to the southward, from Slotö, which is to be passed very close, towards Veilö Island; it then turns to the southward, passing the point S. by W. of Helnæs, and then north-east between Barnholm and Kuddeholm, having throughout the whole of this distance the marks on the southern side. The channel then trends to the eastward, but with several bendings, between Treldholm and the Laaland shore up to the town of Nakskov, but is so narrow as not to afford room for working, nor even to swing round the anchor. From Barnholm, however, to the town, on account of its extreme narrowness,

* A recent edition of the *Danske Lods* states that about 4 cables' lengths to the westward of Enerhöi Island, a spit, extending to the northward, has formed itself on the south side of the channel, so that the mark of Nakskov church spire in one with the battery on the south end of Enerhöi would now lead over the spit in 7 feet water; but the spire kept about midway between the battery and a well-defined ridge farther to the northward on Enerhöi, although somewhat too near the ridge, leads to the northward of the spit, on the north end of which a beacon has been placed in 10 feet water.

piles are placed for the purpose of warping. To avoid this narrow, intricate, and shallow channel, larger vessels bound to Nakskov anchor in Helnæs Road, in 15 to 17 feet water, and unload or load there. This road lies between Slotö and the point of Helnæs, and affords sufficient room to swing at anchor; the best berth for which is with the north end of the village on the island of Langö, in one with the north end of Dueholm, and Vestenskov church a little outside of the wood on Store Veilö. *Helnæs Road.*

546. Another good roadstead is further out in the fiord to the eastward of Enerhöi, and to enter it coast along the east side of the island until abreast of the house, then bring up in 18 feet water. *Enerhöi Road.*

547. The pilots for this fiord live on Albue Peninsula, and attend at the given signal. The tide is regular in and out, and is stronger to the eastward of Enerhöi than between that island and Albue. Beacon-money is 4 rbsk. per com. last, by inward, and 2 rbsk. by outward bound vessels, not employing a pilot. *Pilots.* *Tide.*

548. To the southward of the Albue Ledges, the shallow along the coast of Laaland shoals gradually, and may be safely approached by the lead; the most projecting part of it is off Vester Ness, the S.W. point of Laaland, where a neck, consisting of sand and shingle, extends W.S.W. to a distance of $1\frac{1}{3}$ miles within the depth of 4 fathoms. Hence to the next point, the Hyllekrog,* the shallow along the shore is clean, and is broadest abreast of Hyllekrog. *Vester Ness Shallow.*

549. Off the north-east point of Langeland,† the shallow extends more than four-fifths of a mile before a depth of 2 fathoms is found, but it diminishes in breadth until Snöde church bears W. by S., where it splays out to more than half a mile from shore, and is called the Teten Ground; it is rocky, with only 11 to 12 feet water, but there are 17 to 18 feet inside of the shoal. From thence along the coast of Langeland to the southward, the 4-fathoms water-line is only 1 or 2 cables' lengths from the shore. *Langeland Eastern Shore.* *Teten Shoal.*

550. The Nebbe Revle, or Shelves, are of a whitish-coloured *Nebbe Shelves.*

* See the Baltic, Sheet I., Femern to Bornholm.

† See Entrance to the Baltic, Sheet III., Great and Little Belt, and Sheet IV., Kiol Bay.

sand, and lie to the southward of Spodsbierg Ferry-house, with a depth of only 4 to 6 feet, at 3½ cables' lengths from the beach, where the shallow is steep from 7 to 5 fathoms. In daylight the shoal is easily distinguished by the tint of the water over the whitish sandy shallow; but working along shore at night, do not stand in nearer towards this part of the coast than 7 to 8 fathoms.

Spodsbierg Ferry.

From Spodsbierg a ferry crosses the Belt to Taars. At the head of the pier, erected there for the ferry vessels, there are 8 feet water.

551. From the Nebbe Shelves to Gulstav, the south point of Langeland, the 4-fathoms water-line is nowhere more than half a mile from the shore. On a high hill of Fakkebierg, a mile from Gulstav, there is a Fixed light, elevated 128 feet above the level of the sea, and pointing out the southern entrance to the Great Belt. A short distance to the northward of Fakkebierg, on the shallow along the eastern shore of the island, there is good anchorage for such vessels as are prevented by N.W. gales from proceeding to the westward.

Fakkebierg Light.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY.

CHAPTER VIII.

THE EASTERN CHANNELS BETWEEN THE GREAT BELT AND THE BALTIC.*

552. Off Bisserup a shallow spit extends to a distance of 1¾ miles from the coast; the inner part of it is rocky, and at 1¼ miles from the shore there are about 12 feet water: this sandy spit, and the shallow along the eastern side of the island of Glænö, forms Bisserup Road. Coming from the westward, and bound to this anchorage, Glænö shallow, which stretches off to the southward 1¼ miles, is to be passed in 3 or 4 fathoms; and when a broad road, leading from the village of Bisserup to the beach appears well to the westward of a corn magazine on the beach, you will have opened a kind of bay between Glænö shallow and the spit. Run into it on that mark, until Snedinge Gaard farm comes to the northward of Ormö, the small island N.E. of Glænö: you may anchor there in 3 or 4 fathoms water, and be well sheltered against all winds except those from W.S.W. to S., which will throw in some sea or swell; but the holding-ground being good, vessels provided with suitable ground-tackle may ride out a gale. Along the shore from this sandflat to Karrebek the 4-fathoms line of depth is from half-a-mile to a mile from the shore; but at Karrebek the shallow again forms a bay, where the depth of 4 fathoms is only distant a third of a mile from the beach, and where vessels may load or unload which are too deep to enter the harbour. Westerly and southerly winds may occasion some sea there, but the holding-ground is good. *Bisserup.* *Bisserup Road.* *Glænö.* *Ormö.* *Karrebek Road.*

553. At Karrebek the harbour has been opened to the sea by a canal cut through the neck of land with a pier on each side of the entrance: at the head of the outer pier the depth is 15 feet, and a little way inside 12 feet. The depth is variable, but at present it admits vessels drawing 11 feet into the outer part, *Karrebek Harbour.*

* See The Baltic, Sheet I.

Marks. where mooring-posts are placed. In running for this harbour you must avoid a foul flat, extending 4 cables' lengths from Eenö, and therefore do not stand more easterly than Karrebek church in one with the large magazine.

Pilots. Two pilots are stationed here, and attend without any signal. Outside the harbour there are two warping buoys, and in the harbour fire and candles are allowed on board.

Eenö and Dybsö. Dybsö Havn. 554. Off the islands Eenö and Dybsö, at a mile from the shore, there are 4 fathoms. Dybsö Havn is good, but very narrow: to enter, you must coast along the shallow in 3 to 4 fathoms water, until Veilö church is just open to the eastward of Dybsö Island; then follow that mark till past its south point, when you will be in the harbour, and may anchor in 17 feet water, midway between Svinö and Dybsö; but as the harbour is too narrow to swing round a single anchor, it is necessary to moor.

Svinö.

Aunö and the Rön 555. Between Svinö and the far-projecting neck of land called Knuds Head lie the little island of Aunö and the Rön, a rocky shoal of half-a-mile in length, and partly dry and overrun with grass between the rocks. From the end of the rocks the distance of the 4-fathoms line is 2 miles N.W., and at 6 cables' lengths from them there are only 6 feet water. To the westward of the Rön there is another detached shoal with 5 feet water, and between them a crooked inlet, with a 19-feet bar; but moderate-sized vessels may run up till within half-a-mile S.W. of the Rön, where they will have an excellent and well-sheltered anchorage in 4 to 5 fathoms; and small vessels which can cross a second bar with 8 feet water, inside of that anchorage, will find still better shelter abreast of the village Skaverup, in the inner part of the bay with deep water.

Skaverup.

The last-mentioned detached shoal is joined to the shallow along the Knuds Head neck of land by a flat with 13 feet water; and the space between these shallows, being from 1½ to 4 cables' lengths wide, affords an excellent anchorage in 18 to 19 feet water, more than 2 miles to the eastward of Knuds Head Point, and 3 cables' lengths off the Draget, the name given to the low and sometimes inundated part of the neck.

Draget.

Knuds Head Reef. 556. From the extreme point of Knuds Head a reef runs off N.W. by W. to a distance of 2 miles, where it ends in 3 fathoms, and a cable's length farther in 4 fathoms. At the distance of somewhat more than a mile from the head lies a rocky patch

with only 6 feet water; and to the eastward of that patch about two-thirds of a mile from the head, there is a passage across the reef, with a breadth of 4 cables' lengths, and a depth of 12 feet. The reef branches off from the head N.W. and S.W., so that at 8 cables' lengths from the land it is a third of a mile wide, whereas its breadth at the end of either of those outer branches is not more than a cable's length across.

557. The Vene Ground and the Kirke Ground may be considered as a continuation of the Knuds Head Reef, the channel between which and them is only 7 cables' lengths across, with 5 to 7 fathoms water. The leading mark for this channel is, Fæmö church open to the westward of Nörreby village on Fæmö island; and if prevented by hazy weather from seeing this mark, then keep a small copse, a little to the N.W. of Karrebek, midway between that church and a remarkable hollow in the wood at Nybro, to the northward of Karrebek.* *Vene Grounds Pass.*

558. The Vene Grounds consist of five separate patches, of which the westernmost is the smallest, and carries 23 feet water; the four others may be considered as one, as they are separated only by narrow channels. The two south-eastern shoals have respectively 11 and 19 feet on their shoalest parts. To the northward of them lies the largest patch extending east and west 2½ miles, and from north to south 7 cables' lengths. It is shoalest on its eastern end, where the depth is only 8 feet over the rock. The fifth is also large—it lies to the southward of the others—is more than 1½ miles from east to west, by a mile across, and contains several rocks, 2, 5, and 6 feet under water, in the extent of about 3 cables' lengths: it is the most dangerous part of the whole group. It lies about 4½ miles from Knuds Head, and at the same distance from the island of Væirö; and as it shoals from 4 fathoms to 6 feet on its S.E. side, in little more then the length of one cable, no vessel ought to approach it within 4½ fathoms on that side. To warn them off, a floating beacon has been placed, 4 cables' lengths S. by W. ½ W. from the shoalest spot, carrying one broom on a red pole, and lying in 3 fathoms. *Vene Grounds.* *Beacon.*

The mark for passing to the eastward of the Vene Grounds has been stated above in Art. 557; and to clear them to the south-

* Views 30 and 31.

ward keep Blaabierg, a conspicuous hill covered with wood, open to the southward of the Draget, on the Knuds Head shore.*

Kirke Ground.

559. In the same direction from Knuds Head lies the Kirke Ground, but separated from the Vene Grounds by a channel 2¼ miles wide, with a depth of 5 to 7 fathoms. The extent of the Kirke Ground is N. and S. a mile, and E. and W. somewhat more; and its most dangerous part is to the south-eastward, where there are some rocks, with only 4 feet water. They bear N.N.E. 3¾ miles from the N.E. point of Væirö, and are the more dangerous from being steep-to from 6 fathoms to 4 feet water; so that they ought not to be approached on their south side within the depth of 6½ fathoms. A floating beacon watches about 3 cables' lengths S. by W. from the middle of the shoal, carrying two brooms on a red pole, in 4½ fathoms water.

Beacon.

Kirke Ground Pass.

To pass between the Kirke Ground and the Vene Grounds, Holsteinborg castle is to be kept in one with the east end of Ormö, which little island will appear like a round wood behind Glænö. Three woods will be seen on the north shore of Laaland; and when they are all open to the westward of Væirö you are clear to the westward of the Kirke Ground.†

Laaland.

560. Having thus finished our account of the shoals projecting from Knuds Head, we shall describe the islands off the north side of Laaland, with the intricate passages between them, and to simplify the description it will be divided as follows:—

1. The islands lying in the shallow near the shore, to the westward of Saxkiöbing Fiord, Raagö, Raagö Kalv, and Lindholm.

2. The islands on the extensive flat off Rod Ness, (the point to the eastward of Saxkiöbing Fiord,) Askö, Lilleö, Feiö, Skalö, and Væirö.

3. The islands on the flat extending from Vix Ness, viz.; Vixö and Fæmö.

Between these islands lie several passages that would be very difficult to navigate if not marked by numerous beacons, all of which are stakes driven into the ground, and standing from 4 to 6 feet out of the water, with brooms on their tops. The northernmost islands, Raagö and Raagö Kalv, stand on a large flat, which, between them is dry at low water, but outside varies from 2 to 6 feet. This flat extends E. and W. 1 or 2 cables' lengths; N.E.

Raagö and Raagö Kalv.

* View 32. † View 33.

three-quarters of a mile, and N. by W. 3 miles to the 4 fathoms' line, including a large patch of foul ground, projecting 1¼ miles from Raagö Kalv; its eastern edge is marked by a stake with a bundle of straw. South of Raagö the flat projects half a mile, forming Flynder Spit, on which there is a stake with a broom, in 8 feet water. *Flynder Spit.*

561. From the Laaland shore a sandy flat with a reef, called Ravnholt Hage, stretches off towards Raagö Kalv, with only 6 feet water, at a third of a mile, and a little farther out but 10 feet, where there is a stake with a broom. *Ravnholt Hage.*

Between these two shallows of Raagö and Ravnholt Hage, lies the entrance of Raagö Sound, in the outer part of which there is a 2-fathoms' patch; and farther in a 9-feet shoal, called the Middel Ground. The latter is 3 cables' lengths to the northward of Ravnholt Hage, and extends fully 2¼ cables' lengths from E. to W., and 1¼ cables' lengths from N. to S., with a beacon on its west end, in 10 feet water. To enter Raagö Sound from the westward, bring Askö church in one with the small cliff of Avernakke, on the south point of Feiö; and this mark will lead between Ravnholt Hage and the Middel Ground beacons, and also to the southward of the beacon on Flynder Sand; or bring a lofty tree with a large head, which stands in the middle of Vesterby village in one with the northern edge of a single large house, built on a yellowish sandy cliff on the west side of Feiö; and this mark leads close past the beacon at Ravnholt Hage. Another and nearer mark to pass between Ravnholt Hage and the Middel Ground beacons is, to keep a farm which may be seen to the northward of Vesterby Mill (on Feiö), and surrounded by single trees, well open to the southward of Raagö. These trees, it is said, have grown so much as to have now the appearance of a thick grove, and are very conspicuous. *Raagö Sound.* *Middel Ground.*

562. At the south-west side of Raagö there is good anchorage, sheltered against all winds, abreast of the houses, in 14 feet water, and 3 cables' lengths from the beach; but vessels drawing 10 feet only can proceed round Flynder Sand beacon to the Staal Deep;* and they must keep on the mark mentioned above until abreast of the ferry-house on Feiö, when they may haul more to the southward, but minding to keep the west side of the small island of

* See Articles 579 and 581.

Skalö in sight, outside the island of Feiö, in order to pass between the beacons of Avernakke Hage (a sandy spit off Feiö), and of Krage Ness Spit, off Laaland.

Krage Ness

This passage through Raagö Sound is commonly used by the coasters because the current there is much less violent than that in the Staal Deep, to which, however, vessels drawing more than 10 feet are obliged to resort; and where those two passages unite, abreast of Raahave Wood, there is a much-frequented stopping-place, in 2 and 2½ fathoms; the shore there offering good shelter against all westerly winds as far round as N.N.W. The shallow off Krage Ness, on Laaland, is half a mile in breadth, with 3 to 5 feet water; it is called Krageness Öre, and its edge is marked by a stake with a broom, standing in 10 feet water; but the 4-fathoms' line is three-quarters of a mile from the shore. A mile to the southward of Krage Ness there is good anchorage, abreast of the ferry-house, at a short half mile from the shore, in 12 to 13 feet water, on clay, beneath a thin layer of sleek, overrun with seaweed. Hence the shallow trends with some sinuosities towards Lindholm, off which a reef extends north-westward more than a mile, with less than 6 feet water, to the Steenhielm Rocks, which carry only 4 feet water, and which are marked by a beacon, standing in 7 feet water, a cable's length to the northward. Between this reef and Kielderness Reef there is a good anchorage, in 12 to 13 feet water, about half a mile off shore; but it is very little frequented.

Krage Ness Öre.

Lindholm.

Blang Point.

563. Off Blang Point the shallow has a depth of 1 fathom, at half a mile, and 2 fathoms at a mile from the shore; but to the southward of the point these limits are respectively, 1½ and 4 cables' lengths; whereas abreast of Svanevig Bay they are 6 cables' lengths, and 1¾ miles; and finally, off Bandholm they are at a half and 1½ miles. On this last part of the shallow, in 12 feet water, the Hollænder Ground is situated, a little to the northward of Bandholm, and distant nearly 9 cables' lengths from the shore. The depth on this shoal is only 6 feet for three-quarters of a mile along the shore, and for the breadth of 200 yards. S.E. of the shoal a beacon stands in 11 feet water; and there are two more beacons farther in which are to be kept on the starboard side in entering.

Hollænder Ground.

Bandholm.

564. Vessels bound to Bandholm may enter by keeping open the street leading to the inn, a remarkable long house, standing

to the westward of the magazines and of the custom-house. To facilitate a very considerable embarkation of corn, the present possessor of Knuthenborg, to whom Bandholm belongs, has built a pier, 1050 feet long, and 120 feet wide at the pierhead, with two shorter piers, so as to make a harbour spacious enough to admit about 30 vessels, with a depth of 10 feet. Here vessels may load or unload with great facility, and new vessels may be constructed on a slip 40 feet wide. The direction of the entrance is S.S.W., S.W. ½ S., and W. by S., through a gut cut across the shallow, for more than 6 cables' lengths 10 feet deep, and 60 feet wide, and in one place 120 feet, in order to allow vessels to swing. A pilot is stationed here; and the pilots of Feiö Island also take vessels in and out of this harbour. Bandholm is also the shipping place for the town of Maribo, the merchants of which pay regular harbour money to the proprietor. The best anchorage in the inlet is about 4 cables' lengths from the pierhead, and half a cable's length to the southward of the innermost beacon, in 11 feet; but it is indifferent holding-ground. The place where the ballast is to be thrown is yet more to the southward.

Pier and Harbour.

Pilots.

Maribo.

From Bandholm Pier the shallow trends along shore towards Oureby, where it shuts up the mouth of the rivulet so as to leave a passage for boats drawing 5½ feet only, to the little town of Saxkiöbing. The channel is, however, to be dredged out to 6½ feet, and there is a cut through the shallow, by which vessels drawing 9 feet may run alongside of a pier erected at Oureby on the eastern side of Saxkiöbing Fiord. A mile and a half outside of Oureby, and in the middle of the fiord, there is a patch of rocks, called the Korsöre, with 6 feet water, and a beacon at its north end, in 9 feet.

Oureby Pier.

Korsöre Shoal.

565. We shall now describe the chain of islands and shoals which stretch off to the northward from Rod Ness Flat, before giving any account of the channel between them and the Raagö range of islands. From the woody point to the N.W. of the mansion of Oureby Gaard, the Skov Sand stretches out to the north-westward, to the distance of 1½ miles beyond Rod Ness. It is all very shallow, having nowhere more than 6 feet water; and at its extreme point only 3 feet, over rocks. On its S.W. elbow there is a beacon in 10 feet water.

Rod Ness Chain.

Skov Sand.

566. Nearly in the same N.W. direction, on the shallow, lie the Törre Ground, the Skö Ground, and the Askö Kirke Ground,

Törre Ground.

The first two are separated by a narrow channel, the Törre Ground being three-quarters of a mile N.W. and S.E., and half a mile N.E. and S.W., with from 1 to 6 feet water; and in several places dry at low water, or the rocks showing their heads. Near the middle of its south side a beacon stands in 10 feet water.

Skö Ground. The Skö Ground is a cable's length farther to the N.W., and extends 3 cables' lengths, carrying 5 to 6 feet water, with a beacon to the southward of it in 10 feet water.

Askö Kirk Ground. The Askö Kirk Ground is more than 2 cables' lengths to the northward of the Skö Ground, and lies about half a mile to the southward of Klokkeholm Point of Askö; it extends within a depth of 6 feet above 3 cables' lengths N. and S., and about 2 cables' lengths E. and W.

Askö and Lilleö. 567. To the northward of these shoals a large and very shallow flat surrounds the islands of Askö and Lilleö, between which there is not more than 2 feet water, and sometimes the whole space is dry. On the rest of the flat the depths are irregular, from 1 to 6 feet, within which it extends, in different directions, from 2¼ cables' lengths to three-quarters of a mile; and towards Skov Sand it is very foul, though leaving between them a couple of passages for small craft. To the westward of Konemad Point (the S.W. point of Askö), a reef juts out 4 cables' lengths, within the depth of 6 feet, off which there is a beacon in 9 feet.

Konemad Point.

Oster Head. 568. From Oster Head, the S.W. point of Askö, another reef projects nearly a mile to the south-eastward, and between it and the Skov Sand lie two patches of rocks, with less than a fathom water. The navigation between the Skov Sand and Askö is, therefore, very difficult, and available only to small craft and boats; the depth being nowhere more than a fathom.

569. Between the flat of Lilleö and the island of Feiö there is somewhat deeper water, which offers a passage to vessels drawing 8 or 9 feet; but in this channel there are three shoals: the Middel Ground, the Tosse Ground, and the Kirke Ground. Feiö Middel Ground is more than 6 cables' lengths from N. to S. and 4 from E. to W., with 2 to 6 feet water. On its north end a beacon stands in 8 feet water; and between its south end and the flat of Lilleö there are 8 to 10 feet water.

Feiö Middel Ground.

Tosse Gound. 570. The Tosse Ground is a small patch, carrying 6 feet water, and lying half a mile W.N.W. of the last shoal, with a beacon at its north end in 10 feet.

571. Feiö Kirke Ground is surrounded by deeper water than the last-mentioned flats; its extent, within the 2-fathoms line, is 4 cables' lengths S.S.E. and N.N.W.; and its shoal part is a 6-feet patch of rock, only a cable's length each way. On its south end a beacon stands in 10 feet water. Between the Kirke Ground and Feiö there is good anchorage, in 12 feet water, well sheltered against all winds. *Feiö Kirke Ground.*

572. Feiö is a pretty large island, and, together with Skalö, stands on the flat which forms the eastern side of the Staal Deep; but that flat extends a great distance to the northward, and between the two islands is dry at low water. From the south-east point of the island, called Feiö Slette, a reef extends to the southward 2½ cables' lengths, where a beacon is placed in 8 feet water. This beacon and that on the Middel Ground are, together, called Feiö Marks, as between them there is a channel with 9 to 10½ feet water, which, though only 1½ cables' lengths wide, is much frequented by the coasters, the passage between the Middel Ground and the Lilleö being seldom used. To make the Feiö Marks from the northward, keep Askö mill in one with a wood in Dyrehaveskov Park near Knuthenborg; or, if this is not visible, keep the village at the north end of Askö open of Slette Point until both beacons are seen, or until a lonely farm, on the south-west end of Feiö, is in one with a conspicuous gap in the wood at Krage Ness on Laaland; then steer on this mark until Fæmö church is in one with Slette Point, which is then the leading mark past Avernakke Hage, a sandy spit extending from the S.W. point of Feiö, with 1 fathom water at the distance of 5 cables' lengths, and with 4 fathoms 2 cables' lengths farther out. At the end of this spit there is a beacon in 9 feet water; and you will have past it when the S.W. point of Skalö is well open W. of Feiö. If the beacon should be gone, the mark for it is a small tree with a round head, standing on Avernakke Point in one with Feiö church. *Feiö.* *Feiö Marks.* *Avernakke Hage.*

To run for Feiö Marks from the southward, Feiö mill is to be brought in one with a single tree, standing at the east end of a large house with two white gables, nearly N.W. Coming from the eastward or westward, keep the southernmost single house on Fæmö 1° or 2° to the northward of the southern end of a cliff on that island; or, which is a better mark, keep a cluster of poplars on Feiö just open to the northward of the trees near Feiö church. *Feiö Marks, from the southward.*

573. The south side of Feiö, between the points of Slette and
Dyveke Bay. of Avernakke, forms a deep bay, called Dyveke, in which there is good anchorage in 12 to 14 feet, 3 or 4 cables' lengths off shore; and in the inner parts of the bay the vessels belonging to Feiö and Fæmö secure themselves in winter to the remaining piles of a harbour, now in ruins; but the greatest depth is only 5½ feet. The ground there, and also in the anchorage farther out, is covered with seaweed, and underneath clay and sand. The
Pilots. pilots live at the village of Osterby, and are bound to maintain all the beacons in the vicinity.

Port Charges. Vessels importing or exporting goods at the custom-houses of Bandholm and Saxkiöbing are charged 2 rbsk. per com. last, as beacon-money, and the pilots are entitled to demand this beacon-money from all vessels passing to the southward of Feiö and Fæmö.

574. On the eastern side of Feiö, abreast of Slette Point, the shallow joins that of Fæmö, leaving to the northward a deep-water inlet, with more than 4 fathoms between those islands, and from 5 to 7 cables' lengths wide. From the north-east shore of
Hiortemose Ground. Feiö, the extensive flat of Hiortemose Ground, with only 6 feet or less water, projects half a mile. Off the north point, the Skovnæb, as well as along all the north side of the island, the depth is very irregular, and the 3-fathoms line is nearly a mile distant. Between that point and Skalö there is a bay, in which vessels drawing 10 feet may find a safe anchorage, sheltered against all winds, and about 4 cables' lengths from the shore.

575. From the island of Skalö the shallow branches off in three
Raagö Nebbe Ground. directions: 1st, N. by W. to the Raagö Nebbe Ground, on which there is only 1 fathom water, at 1½ miles distance; 2ndly, 1¾
Skalö Ground. miles to the northward towards the Skalö Ground, with only 2 to 6 feet water, over rocks which are often dry; and, finally, N.E.,
Klör Ground. three-quarters of a mile to the Klör Ground, with from 2 to 5 feet water only. To the northward of the two former lies the great
Staal Ground. Staal Ground, which stretches out N. by W. for more than 3 miles, with a breadth of from 2½ to 4½ cables' lengths, the south end of which is dry, with a low water-stand; on its S.W. edge is a stake with a bush. Vessels drawing less than 7 feet may pass between the Staal Ground and the two northern branches, but only when being intimate with the localities.

576. To the eastward of these latter shoals, and forming as it

were a continuation of the Hiortemose Ground, there is a large shoal, called the Skalbak, the middle of which is dry for a quarter of a mile, and all very shallow. It lies N.N.W. and S.S.E., and is nearly 1¼ miles long, and a third of a mile across the middle, but narrows towards each end. To the north-eastward an arm of this shoal stretches off to the distance of 2¼ miles, and embraces a 12-feet flat, 7 cables in length. *Skalbak Shoal.*

577. On the northern extremity of this great group of shoals lies the island of Væirö with its surrounding shallows, which are very irregular both in dimensions and depth; for while the distance to the 4-fathoms line E. and N. is only 5 cables' lengths, it is 1¼ miles towards the N.W., and in this direction on the shallow there are some rocky patches, carrying 3 or 4 feet water, and lying from 4 to 6 cables' lengths from the island; and another patch with 5 feet water nearly a mile to the westward. *Væirö.*

578. From the South point of Væirö projects the Valle Ground, with less than a fathom depth to a distance of more than 4 cables' lengths, and then suddenly drops into 3 fathoms; but its light-coloured materials make it easily discernible. To the westward of the Valle Ground there is good anchorage in 15 feet water; and to reach it from the eastward, Væirö may be passed between 4 and 7 cables' lengths distance, taking care to avoid the end of the Valle Ground; and when that shoal has been rounded, steer 2 cables' lengths farther to the anchorage. Vessels may lie there with all winds; but being exposed to some sea from the N.W. and W., a better anchorage may, in this case, be taken off the south-east side of the island, in 18 to 20 feet, above 4 cables' lengths from the beach. On the north-east end of the island there is a Revolving light, 51 feet above the sea, exhibiting, every half minute, a bright glare, which may be seen 10 miles off. *Valle Ground.* *Væirö Revolving Light.*

This passage along the south-east side of Væirö, between it and the Skalbak, ought only to be attempted during the daytime, when it is possible to see the Valle Ground; and great attention must be paid to avoid a patch with 7 feet water, lying midway between the island and that shoal. Between this patch and the Skalbak there is a 3-fathoms' passage, through which even a frigate might run, but only when well guided by the lead along the shallows.

579. This long series of islands and shoals which stretch 15 miles N. by W. from Rod Ness, are separated from the Raagö

Staal Deep. division by a remarkable channel, called the Staal Deep, and farther in, by the Lindholm Deep and Saxkiöbing Fiord, all of which gradually decrease in breadth and depth.

At the mouth of this channel, between the shallows of Raagö and Skalö, the depth is from 6 to 8 fathoms; and the leading mark in, from the westward, is Vesterby mill, on Feiö, in one with the westernmost house on Skalö, which is the leading mark, until Raagö bears S.S.W. Then the westernmost house on Feiö is to be brought in one with the cliff to the N.W. of the ferry-house, till abreast of Skalö, the S.W. point of which, as well as that part of Feiö lying to the northward of the ferry-house, may be approached within a cable's length. The shallows bordering the channel are very steep, especially to the northward of Raagö, and are therefore difficult to approach by the lead; but the shallow is denoted not only by the tint of the water, but nearly the whole distance by the rippling occasioned by the current.

Pilots 580. At Vesterby, on Feiö, from whence a ferry crosses to Krage Ness on Laaland, there are resident pilots for all the neighbouring places; but as it frequently happens that they are not able to get out in time to meet vessels when coming in, it is proper that directions for proceeding as far as the ferry-house should be generally known. Beacon-money is to be paid to the pilot.

Staal Deep. 581. Vessels bound farther in, through Lindholm Deep to Bandholm, Oureby, or Saxkiobing, have to pay attention to the following shoals:—on the Laaland side, the Krageness Öre, the Steenhielm, and Lindholm reef; and on the other side, to Avernakke Hage, off Feiö, and Konemad Hage, off Askö; these five shoals being all pointed out by beacons, as before mentioned. The mark leading between the beacons of Konemad Hage and Lindholm reef is to keep Feiö church midway between two houses, on the eastern part of the village of Vesterby, and the roofs of those houses plainly visible, by which the depth will be 4 to 8 fathoms until about 6 cables' lengths to the southward of Lindholm, where it decreases to 3 fathoms for the distance of 4 cables' lengths. Farther in, the fiord is from 260 to 130 fathoms wide, with 16 to 10 feet water; the mark for it is Radsted steeple midway between two woods, of which the one is to the southward and the other to the northward of the mansion of Oureby Gaard. After having

passed the beacons on the Törre Ground and Skov Sand, which are to be left on the port side, the Korsöre beacon is to be left to the westward, by edging a little easterly, until Askö church is in one with the woody point on the port side, when the anchor may be dropped in 8 feet water.

582. The third and eastern range of islands extends from Vix Ness, off which there is an extensive shallow called the Hiulsand, which, together with the patch of Vixö Skal, will be described hereafter, along with Güldborg Sound. On the western part of the above shallow lies the small cay of Vixö, and therefore the north-western part of the shallow is called Vixö Flat. From thence the shallow trends southerly, passing Vixö and Vix Ness, in the direction of Taars, where it forms a deep bay, and then again towards the N.W. to Rod Ness and the Skov Sand already described. The depth in this spacious bay is everywhere 2 to 3 fathoms, except on a single patch of 10 feet, and thus offers a very good refuge in bad weather. *Vix Ness Chain.* *Hiulsand.* *Taars Bay.*

583. Outside of this bay the Stemme Tofte extends 1¼ miles towards Fæmö, though only 3 cables' lengths in breadth, and is separated from Vixö Flat by a deep-water channel. Throughout that extent it has less than a fathom depth, and consists of sand and rocks, overrun with seaweed. On its south end it shows a large stone, generally dry; and off its north point a beacon stands in 9 feet water. This shoal is passed to the northward between its own beacon and that of Fæmö Slette, by keeping Osterby mill, on Feiö, in one with a remarkable tree in the village of Osterby; or, if this mark cannot be distinguished, by keeping Vaaelse church, on Falster Island, well open to the southward of Redslev Wood: the church has no steeple, but may be known by a mill and a single house close to it. Another mark for this passage is, Vaaelse and Hvedby mills in one. *Stemme Tofte Shoal.* *Stemme Rock.*

584. The island Fæmö is surrounded by pretty extensive shallows. Off the south point, the Slette Reef extends nearly a mile, to 6 feet water, and 200 feet outside the reef, a beacon stands in 11 feet water. The above-mentioned mark, Osterby mill in one with a tree in the village, also carries between Fæmö and Lilleö, where the depth is between 2 and 3 fathoms, as far as Feiö Marks. *Fæmö.*

From Slette Point the shallow, as far as the east point of

the island, is nearly a cable's length wide; but there it projects 2⅛ cables' lengths from the beach, and then bends.

Skielle, or Seal Reef. Distant nearly 9 cables' lengths from the east point, lies the Skielle Reef, or, more properly, the Seal Reef, a narrow ridge, generally dry and easily distinguished by its white sand, and by the seals and birds which collect there. It is surrounded by a flat, with sand and rocks, which spread nearly half a mile north and south, and half this distance east and west, within the depth of 1 fathom on the south end, and which are in some places dry. Six cables' lengths S.E. from the Seal Reef there is a small patch of sand and rocks, with 5 feet water, round which the shallow extends more than 3 cables' lengths within the 2-fathoms line. Between this patch and the Seal Reef there is a very narrow 3-fathoms passage, in the direction of N.E. and W.S.W. Inside the Seal Reef, also, there is a passage for small craft not drawing more than 6 feet; but on account of some rocks in it, carrying only 5 feet, and without any good leading mark, it is seldom frequented but by boats.

The whole extent of these shoals, within the limits of 4 fathoms, is about 2 miles from the east point of Fæmö; and on their south-eastern extremity a floating beacon, with two brooms on the pole, watches in 14 feet water. Its marks are, Fæmö church and mill in one, and Taars church on Laaland well open west of Vixö.

Steenöre Nakke Reef. 585. Off the north-east point of Fæmö, the Steenöre Nakke projects 6 cables' lengths into 6 feet water, and nearly 8 to the depth of 10 feet, where it suddenly drops to 5 fathoms. To the westward of the reef, the limit of 1 fathom water is only half a cable's length from the beach; but at Darre Point, the N.W. shoulder of Fæmö, its breadth increases to 2½. From the beach to the 4-fathoms line of water the distance is, abreast of Vindeshöi, 7 cables' lengths; off Darre Point to the end of a narrow spit, 2 miles; and off the western point of the island, about a mile. Along the western side of the island the shallow is a mile broad within the 2 fathoms, and upon it is the Harehiord Shoal, nearly half a mile long and more than a cable's length wide, with 6 feet water: on its western side stands a beacon pole with a broom on it. Between it and the island there is a passage with 10 or 11 feet. Finally, 6 cables' lengths to the southward of the Harehiord, ther

Harehiord Shoal.

is another foul shoal, the Skopp, with 6 feet water, 2 cables' lengths long and 1 wide. The breadth of the flat within the limits of 2 fathoms water is more than a mile, but between the Skopp and Fæmö there is a 9-feet passage. Outside of the Skopp the shallow joins the Feiö Shallow, and the depth being only 11 or 12 feet, the navigation between these islands is limited to that draught. If vessels drawing 12 feet attempt it, they ought to keep a third nearer to Fæmö than to Væirö till within a short mile of Fæmö; then Feiö ought to be kept a third nearer than Fæmö. When Fæmö church and mill are in one, the north-west shallow of Fæmö will have been passed, and you may run Askö mill somewhat to the westward of the park (Dyrehaveskov) at Knuthenborg; or, still better, keep the village on Askö visible outside Slette Point of Feiö, which mark clears the Harehiord and the Skopp, and leads towards the beacons called the Feiö Marks.

Skopp Shoal.

Channel between Feiö and Fæmö.

586. To the south-eastward of Fæmö and of the Seal Reef lies the inlet of Guldborg Sound, which separates the islands of Laaland and Falster; and we shall begin our directions with the Falster shallows on the eastern side of the inlet.

Guldborg Sound.

587. Off the woody point of Vesterskov and the island of Suderö, there is a large and very foul flat, with less than a fathom water; but being divided by a bend in the shallows into two horns, they are accordingly named the Vesterskov and the Suderö Flats. The extent of the whole flat, within the limits of 4 fathoms water, is 3½ miles; and outside of that another large shoal, called the Ko Ground, with from 6 to 11 feet water, and rocky in some places; and within that depth it extends E. and W. more than a mile. South Hvedby and Vaaelse churches in one, is the mark for the beacon in 15 feet water on the N.W. point of the shoal; and Vaaelse church in one with the eastern edge of Valdnæs Wood, is the mark for its S.W. edge. Both these churches are without steeples, and when nearly in one, are the only churches to be seen between the two woods. You pass to the northward and outside of the Ko Ground by keeping Waldemar tower, at Vordingborg, a town in Siælland, in one with the southernmost hummock of the high Kulsbierg hills. The channel that separates the Ko Ground, from the Seal Reef of Fæmö is 5½ cables' lengths wide, with a depth of 4 to 7 fathoms; the leading mark through it being Taars church in one with a beacon, surrounded by young trees,

Vesterskov and Suderö Flats.

Ko Ground.

on Vixö. In working through, in order not to come too near the Seal Reef, do not open the church to the westward of Vixö; and, on the other hand, not to borrow too much on the Ko Ground, the church is not to be brought to the eastward of the eastern edge of Vixö Wood. But these marks can only be used during very clear weather; for, the island not being high, the small beacon on it is easily lost in the land behind, when beyond the distance of 5 miles.

Inner Channel. 588. Another channel, much frequented by coasters, runs inside of the Ko Ground, between it and the island of Falster, and admits vessels drawing less than 12 feet. Kastrup church in one with the middle of Blaabierg, both in Siælland, leads mid-channel; the deepest water is found by keeping the church in one with the south end of Blaabierg, while abreast of Vesterskov Flat; and, on the contrary, by keeping it in one with the north end of Blaabierg when in the vicinity of Suderö. In this manner, the shoalest parts both of the Vesterskov Flat and of the Ko Ground may be avoided. The difficulty in using this mark is the great distance of the church, so that frequent whitewashing is requisite to make it discernible during thick or hazy weather. The same mark *Suderö Flat.* will lead past the Suderö Flat, off which, as a further guidance, there is a beacon, in 11 feet water, distant 6¾ cables' lengths from the shore, and inside of which no vessel ought to come, but pursue the marks already given till Kippinge church comes to the westward of Redslev Wood, when the flat is passed.

Guldborg Sound. 589. If bound for Guldborg Sound, steer towards the Hiulsand, and look out for the beacon, which lies a little to the southward of the Vixö Skal; then steer directly for the south end of *Alstrup Reef.* Alstrup cliff, from which Alstrup Reef projects 1¼ cables' lengths, and carries on its west end a beacon, standing in 9 feet water. From this beacon shape a course directly for Guldborg ferry-house, until Maibölle church is visible to the eastward of the ferry-house on the Laaland shore, in order to clear the *Havrehest Shoal.* Havrehest Reef, which extends 3½ cables' lengths N.N.W. from Laaland, with a beacon on its extremity, carrying a bundle of straw, and standing at the spit of the reef. Up to this reef from Hiulsand the shallow runs nearly parallel to the shore, and turns round Havrehest Reef, leaving a fair, deep-water channel between the two ferries into the sound.

590. The Hiulsand is the north-eastern part of the extensive flat off Vix Ness: on its eastern side a beacon with a straw bundle stands in 2 fathoms water, on the outside of some rocks which carry only 4 feet. Close to the north of the Hiulsand there is a small rocky patch, called Vixö Skal, with 10 feet water; and 3½ cables' lengths east of it, and at the same distance from Valdnæs there is another patch, called Meyer Ground, with 8 to 11 feet water, and nearly a mile in length, though but a cable's length across. To the eastward of the latter there is a passage with 2 fathoms water; but 4 fathoms or more will be found in the wider, deeper, and straighter channel, between the Meyer Ground and Vixö Skal and the Hiulsand. *Hiulsand.* *Vixö Skal.* *Meyer Ground*

591. The beacons on the Laaland side of this channel carry bundles of straw, and those on the Falster side brooms, throughout the whole of Guldborg Sound. Notwithstanding all these beacons, the navigation of the sound is rather difficult, for they are easily mistaken in such a winding channel, when seen at some distance. The mid-channel depth as far as the town of Nykiöbing is 3 to 4 fathoms, except on the flat to the southward of Hielmsö, where there are 14 feet in a cut which has been dug through the flat; it extends 310 yards in an E.N.E. and W.S.W. direction, with a breadth of 21 yards, and is pointed out by four beacons, 2 of which on the south side carry brooms, and 2 on the north side bundles of straw. Vessels drawing not more than 14 feet may, therefore, from the northward, proceed to the town of Nykiöbing. *Guldborg Sound.* *Hielmsö Cut.*

To the southward also of Nykiöbing it has also been necessary to make similar cuts, of which that at Haselö Narrows is 8⅛ fathoms wide and 7 feet deep; and another, at Nordmands Sand, is 13 fathoms wide and 7 feet deep, the bottom being so hard as to prevent a greater depth being obtained, which limits the trade with Nykiöbing from the southward to vessels drawing under 7 feet. These cuts, however, have greatly benefited the inland trade; and it is intended to improve the channel still further by opening it through several shallows to the breadth of 8½ fathoms, and to a depth of 8½ feet.* *Haselö Narrows.* *Nordmands Sand.*

592. Nykiöbing has a harbour spacious enough for 40 small vessels, and with a depth of 10 feet, with several piers, besides *Nykiöbing Harbour.*

* See Article 858.

slips for building and repairing vessels; and fire and candle are allowed on board. Every vessel that enters the Sound without clearing at Nykiöbing custom-house, pays 2 rbsk. pr. com. last, beacon-money, which the pilot is entitled to receive.

Port Charges.

Pilots. 593. In the Sound there are two pilots, one at Guldborg, and one at Nykiöbing; the latter takes vessels through Haselö Narrows and farther to the southward.

The holding-ground is good everywhere, consisting of mud, clay, and shells, except in the narrows at Haselö and on the Nordmans Sand, where there is some foul ground, as well as all along the Laaland shore; while the Falster side, on the contrary, is clean, except at Grummers Nakke, and at Grange, where the Swedes, during the war of 1658, intended to build a stone bridge, and the place is still called the Swedish bridge.

Tides. 594. The current, like that in the Great Belt, during settled weather changes regularly, and runs at the rate of one or two knots, the range between high and low water being about 2 feet; in stormy weather, and especially at the beginning of a south-east gale, it continues to run to the northward for several successive days, and sometimes attains a velocity of 5 knots in the narrows at Haselö.

Oure Head Flat. 595. From Oure Head, the northern extremity of Falster, a shallow sandy flat of $1\frac{1}{2}$ miles in breadth, and with less than 5 feet water, extends a mile to the N.N.W. of Dyrefod, a small holm off the point; and all along the western side of this flat, and round Dyrefod and Skaane Holm, the bottom is thickly covered with patches of rock. To the northward of this part of the flat there is a deep swatch with 4 to 6 fathoms water, which is to be carefully avoided, as it has no egress; and yet it might be used as a harbour, or in time of war as a good defensive position for a man of war. Outside of the swatch this flat continues a mile to the north-westward, towards Siælland, with irregular depths. A floating beacon, with a white pole and two brooms, is placed on the north edge of this outer flat in 3 fathoms water, and about 2 miles N. by W. from Oure Head.*

Dyrefod.

Skaane Holm.

596. To pass to the northward of the Oure flat, and to the southward of the Brede Ground, when coming from the westward, keep the western cliff of Masnedö in one with the woody point

* See Plan of Grön Sound and the Stor Ström.

of Stammenakke, until Gundslev church opens to the eastward of Gaabense ferry-house; and when North Hvedby church is hidden by the land inside of Dyrefod Holm, you will have passed the extremity of the flat.

597. The Brede Ground is a large insulated shoal in the middle of the channel between Falster and Siælland, and in a line between Oure Head and the wood of Knudskov. Within its contour of 4 fathoms it is 2¼ miles from N.W. to S.E., and nearly a mile across. On its northern side there is a small 10-feet patch, from which Kastrup church appears in one with the eastern edge of the small Knudsby Wood; and to pass close to the southward of the Brede Ground, whether working or running free, keep Vordingborg ferry pier just open north of Masnedö. *Brede Ground.*

598. Vesterskov and Oure Head flats are separated by a deep bay enclosing the Store and Lille Holms, the depth gradually decreasing from 10 to 6 feet, on a bottom consisting of mud and seaweed. North Alslev church in one with North Hvedby mill is the leading mark into the bay. *Store and Lille Holms Bay.*

599. From Knuds Head, along its low neck of land, as far as the east end of Knudskov Wood, the bank shoals gradually, the 4-fathoms line of depth being from one to two thirds of a mile, and the one fathom line between one and two hundred yards from the beach. S. ¾ W. from the Draget, and a mile from the Head, there is a detached shoal, stretching nearly 2 miles S.S.E., and carrying generally 3 fathoms, but at its north end it has two patches with only 12 feet water. *Knuds Head Neck.*

From the east end of Knudskov Wood a foul reef projects 2 cables' lengths from the beach, with several rocks much farther out, in from 6 to 11 feet water; the outer or 4-fathoms limit of the shoal being more than a mile from the shore. *Knudskov Reef.*

To the eastward of Knudskov Wood the shore-shallow gradually slopes up to the beach, and its widest part is just abreast of the Brede Ground, the 4-fathoms line of water being there three quarters of a mile off shore, leaving a 5-fathoms pass between them, through which vessels of any size may enter the Stor Ström, or channel between Siælland and Falster, and even have a fairer lead into it than by going to the southward of the Brede Ground. This pass, however, being only a quarter of a mile wide, and having no good leading marks, ought to be previously buoyed if to be attempted by a large ship. *Brede Ground.* *Stor Ström.*

Masnedö Island.

600. Off the island of Masnedö the shallow extends almost a mile to the westward, and here the passage again divides into two channels; the largest or Stor Ström, leading, between Falster and Möen, to Grön Sound and the Baltic; the other, though narrow and intricate, following the coast of Siælland, and passing between it and Möen into Faxö Bay. There is also a passage for small craft through what is called the Ferry Deep, between Siælland and Masnedö; and lastly, to the southward of that island, a branch channel from the Stor Ström crosses the Masnedö Flat.

Kalvö.

601. In the first-mentioned channel, the Stor Ström, the small island of Kalvö lies to the westward of Masnedö, surrounded by a flat which extends N.N.W. more than a mile, and which even small vessels ought not to approach nearer than 2 fathoms, on account of its reefs within that line of depth. The marks for the *Kalvö Reefs.* N.W. end of Kalvö Reefs, in 2 fathoms water, are, Vordingborg church in one with the west end of Masnedö, and Kalvö in one with the middle of the island of Baagö. Between Kalvö and Masnedö there is a narrow channel with 4-fathoms water, though seldom used on account of its intricacy and want of leading marks. On its south side Kalvö flat is very steep; and on the reef at its N.W. end there is a floating beacon, with a red pole and a broom on the top, from 3 to 4 fathoms water.

Kalvö Ström.

602. From the south end of Masnedö a reef extends 3 cables' lengths within the limit of 3 fathoms water, where it is steep towards Kalvö Ström, a deep-water branch of the Stor Ström, separating the Masnedö Flat, the Skipper Ground, the Letten Flat and the island of Tærö, from another range of islands and shoals to the southward, projecting off Möen, and consisting of the islands of Baagö and Farö, with the shoals Farö-Iord and the Middel Ground. This channel, however, between Masnedö Flat and the Middel Ground is interrupted by a short 2-fathoms bar, which prevents its offering a continuous 4-fathoms passage of 8 miles in length, along the north side of Baagö towards Tærö and Möen.

Farö Flat.

603. The long flat extending from Farö $2\frac{2}{3}$ miles towards the south point of Masnedö, and forming the south side of the Kalvö Ström, has everywhere good holding-ground, in from 9 to 12 feet water; its western end is called the Middel Ground, and its eastern end Farö-Iord; and it is sometimes used as an anchorage

by coasters. Between Farö and Baagö there are only from 3 to 6 feet water on rocky ground. The broad flat which connects Baagö and Möen is called the Letten, and the depth being only 2 to 5 feet, it is navigable only by boats. *Letten Flat.*

On the south side of Baagö the shallow, at its broadest part, extends half a mile from the shore, and is called the Bredemand Ground; but at the west end of the island the deep water comes close in shore, and there the pilots live. *Bredemand Ground.*

604. Off the Falster shore a 9 or 10 feet ridge of sand lies nearly 7 cables' lengths outside of Dyrefod and Skaane Holm, and continues somewhat parallel to the beach as far as Oure Head battery—it is called Hvedby Hage; and inside of it, a long recess in the flat forms Kiernemelk Harbour, where small craft may lie sheltered against all winds by the shallows, and in 3 or 4 fathoms, though farther up the inlet there are but only 6 or 7 feet. The mark for entering it is, Vordingborg steeple in one with a long hedge running W.S.W. from the houses on Masnedö towards the beach; and if obliged to work in, the steeple may be run from end to end of the Masnedö houses. *Falster Shore.* *Hvedby Hage.* *Kiernemelk Harbour.*

605. From Havnsö, on Falster, a great sandy flat fills up the whole bight to Gaabense Ferry pier, except a small creek there, with 8 feet water, where small craft may find safe anchorage. But in this creek there are two small patches of rocks, the Eensten with only 3 feet water, and a larger reef, the Steenö, with 1 to 5 feet; on the latter there are three beacons, and on the former one. The Steenö lies nearly north of the pier-head, and between them there is a narrow 6-feet pass, occasionally used by the ferry-boats. *Havnsö.* *Gaabense Ferry.* *Steenö Reef.*

From Havnsö, along the shore to the eastward, the breadth of the shallow diminishes, until a little to the westward of Sodse Point, where it extends only a quarter of a mile from the beach, and off Sodse battery the water is deep close in. Farther on in the bight, the shallow acquires some breadth, but gradually shoals towards the beach, until at the pilot-houses of Grön Sound the deep water again washes the shore. A short distance to the eastward of Stubbekiöbing, at Oure Mill, an inlet, with 2 fathoms water was, till lately, the only harbour of that town, and the vessels made fast to posts standing in the ground; but in consequence of its great exportation of corn, a 400-feet stone pier has been erected, and a harbour is dredged out to 12 feet water, *Sodse Point.* *Stubbekiöbing.* *Harbour.*

and an entrance with the same depth is cut through the land flat called Tæstel, in a northerly direction from the mouth of the harbour. The best anchorages besides that of Stubbekiöbing are in Sodse Bay, near the shore, and on the edge of the Gaase-Sand at the mouth of Grön Sound.

Stor Ström. 606. The Stor Ström is the principal channel from Dyrefod to Grön Sound; and having thus described the shallows and shoals on each side, we shall now give the directions for sailing through.

Coming from the westward, and steering E.S.E. from Fæmö, the Dyrefod Flat will be passed, as already stated (art. 596); or, if the weather be hazy, that flat may be rounded by the lead in 3 to 4 fathoms. Then take the mark, Gundslev church well open to the eastward of Gaabense and of the wood behind, and having at the same time Steensby Wood (on the southern extremity of Siælland) a little open to the southward of the houses on Masnedö, you will pass Kalvö in 4 or 5 fathoms; and when passed, bring Gundslev church still farther to the eastward of Gaabense, in order to be well clear of Hvedby Hage. If a large ship should wish to anchor off the Middel Ground, the best place would be in 5 fathoms, with the apertures in Stubbekiöbing church tower just open. Baago mill* open to the northward of Sodse Point will lead outside of Havnsö Sand, but to be in the fair-way, the mill is to be kept at first a little less than midway between Sodse Point and Farö, and then quite midway between them, until the south point of Farö and the north-east point of Baagö are in one, at which time Stubbekiöbing church will be seen in the middle of the narrows, or Sodse Gap. Continue on this mark through the gap and into Grön Sound, but minding that Waldemar tower (at Vordingborg) is not to come in one with the west side of Baagö before Oure mill appears opening to the eastward of the town of Stubbekiöbing; or till Phanefiord church is in one with the ferry-house on Möen, either of which marks clears the Bredemand Hage off Baagö. This last mark is then to be followed, until Harbölle battery on Möen is in one with the east end of Borreknold, a hillock with trees, which will lead clear of the shallows off Falster, to the

Sodse Gap.
Grön Sound.

* This mill has been recently burnt down, but another is to be erected on its site.

eastward of Stubbekiöbing, and is the leading-mark for Grön Sound. Working between Falster and Baagö, keep the lead going, and tack in 4 fathoms, as the shallows on both sides are steep-to.

The directions for entering Grön Sound, from seaward, will be found in the description of the adjacent part of the Baltic.

607. The Færgeström (Ferry-stream) is a narrow channel, with 3 to 5 fathoms, commencing between Masnedö and Siælland, and finishing about a third of a mile to the westward of the Skipper Ground, and to the northward of Farö; but at the western end of this inlet, the shallows off Siælland and those off Masnedö join, and form a flat with 2 fathoms depth. To the eastward of Masnedó this deep water inlet passes between Masnedö Flat and the Trælle Ground, on which bank there are two beacons near Vordingborg ferry-house. When they are in one, do not stand further to the northward; and in like manner there is on Masnedö a beacon, and when it comes in one with the north end of the northern house on that island, do not stand more to the southward, towards the neck of sand projecting from the east end of Masnedö. To the eastward of this neck of sand, those beacons are of no further use, as the south side of the channel is pointed out by 3 stakes with brooms. Vessels too deep to enter Vordingborg road are obliged to anchor, and to moor in this inlet, about mid-channel, and a little to the westward of the ferry-pier, where the holding-ground is good; but the current is strong, and there is very little room if the anchor should come home. During settled weather vessels may run alongside the pier, where the depth is 2 fathoms. *Færgeström.*

608. From Masnedö a flat extends all the way to Tærö, carrying from 6 to 11 feet water, with excellent holding-ground, and being sheltered from all winds, it is a frequent resort of coasters. At the south end of Masnedö there lives a pilot, and E.S.E. from his house there is a safe anchorage in 8 to 9 feet water, about half a mile off shore, with Oure Head just in one with the S. point. Farther to the northward you must avoid the Steenöer patch of rocks, on which there are only 2 feet water, and the marks for which are—Waldemar tower in one with the middle of Oringe Wood, and the beacon on Masnedö in one with the middle of the garden-fence at the northernmost house on the island. *Masnedö Flat.* *Pilot.* *Steenöer Rocks.*

Trælle Ground.

609. To the south-east of Oringe Point extends the Trælle Ground, for the distance of a mile, and separates the Færgeström from Vordingborg Road. This shoal is dry at low water; at its end are the Snekkeö Rocks, with 2 feet water; and at its N.E. end there is a beacon-pole, carrying a bundle of straw.

Snekkeö Rocks.

Vordingborg Road.

The principal entrance to Vordingborg Road is between the Snekkeö and the Trælle Ground, but another very narrow entrance, with 9 to 10 feet water, may be found to the eastward of the shoal. In the middle of the main deep there are two beacons, and Hulemose windmill brought close to the eastward of the bleaching place at Vintersbölle, leads to the outer one; then bring Waldemar tower in one with the white gable of the eastern house in Vordingborg, and this mark will take you 3 cables' lengths to the eastward of Marienlyst, a very conspicuous house near the beach to the eastward of Vordingborg. There is an excellent anchorage there in 7 feet, with smooth water in all winds; and farther in 6 feet, at the Vordingborg pier, where the pilot lives.

Pilot.

Skibsted Deep.

610. Abreast of the Skipper-houses, the Færgeström is separated from Skibsted Deep, another channel, with 4 to 7 fathoms, by a narrow 10-feet flat, which in one place deepens to 13 feet, and offers a passage in a north-easterly direction, or at right angles to that of the above-mentioned deep-water channel, which runs along Siælland to the eastward, with a depth of 4 to 7 fathoms, to the woody point of Stammenakke. There has also, at rather more than 2 cables' lengths to the westward of Skibsted Deep, recently been found another passage with 15 feet water, in a more easterly direction over the narrow 10-feet flat; the stakes which were formerly placed in the Skibsted Deep are now removed to this new passage. Close to the southward of the flat, and about 3 cables' lengths from the shore, lies the Skipper Ground, a small rocky patch with 5½ feet.

Skipper Ground.

Letten Spit.

611. To the westward of Tærö Island stretches the Letten Spit, a narrow flat nearly 2 miles long, and dry at low water. The channel is pointed out by a beacon on the north side of the Letten, and another on the shallow off Siælland, a short distance to the eastward of Stammenakke Point. S.E., about a cable's length, lies a small detached shoal, with only 8 feet water, which is rather annoying to the coasters. Some pilots live at Tærö,

Pilots.

and they are entitled to 8 rbsk. for beacon-money by every vessel passing this way.

From thence the depth in the channels decreases to 3 to 4 fathoms, along the coast of Siælland, until off the south-west end of Langö, where the channel suddenly turns towards the N.E. point of Tærö. This bend is called Langö Vrid; but the deep-water channel continues between the islands of Langö and Möen, as far as Kallehave Point, where it again follows the track of this Siælland shore, until abreast of the village of Bael, and there it closes. *Langö.* *Langö Vrid.*

612. The bend of the channel to the westward of Langö is occasioned by the two Steenkars; the southern one is a rocky shoal, with 3 feet water, on the shallow off the north side of Tærö, and distant 2¼ cables' lengths from that island. A buoy is placed at the east side of the shoal, in 3 fathoms water; the marks for which are, Stege church in one with the north side of the high part of Borren Island, and Baagö Wood well open to the eastward of Skulle Head on Tærö. To the northward of that shoal, about two-thirds of a cable's length, lies the other, an insulated shoal, and consisting of large rocks covered with seaweed, with 3 to 5 feet under water. Between these two Steenkars there are but 7 feet water, whereas to the northward and eastward of them 3 to 6 fathoms will be found; both channels are beaconed. The middle one of three remarkable hillocks on Möen, exactly in one with the south side of a higher hill, the top of which is flat, leads between the Steenkars. *Steenkars.*

613. The island of Langö is joined to Siælland by a 2-feet flat, which extends nearly a mile to the eastward, and which is so steep that it must be carefully avoided, whereas the shallow on the opposite side, along Möen and Borren, shoals gradually. *Langö.*

Off both the ferry piers of Kallehave on Siælland, and of Koster on Möen, the shallows are of considerable breadth, and the channel is therefore but narrow; it has a depth of 6 or 7 fathoms, and runs nearly midway between the opposite shores. *Kallehave and Koster Ferries.*

614. Coming from the westward, and having passed Kalvö, the course is about S.E. till near Farö, when a large rock on the Siælland beach at Steensby Wood will be seen, and by steering directly for this rock, you will pass between the Skipper Ground and Letten beacons; then keep close to the shore, coasting along it, so as to pass close outside the beacon at Stammenakke Point, *Passage from Masnedö to Ulf Sound.*

for which the mark is Kallehave church open to the S. of the pier at Petersværft; now edge still closer to the shore, so as to leave to starboard the third beacon before arriving off Petersværft pier, abreast of which the passage between the Steenkar shoals presents itself to the view, with its beacons on both sides. The very greatest draught this passage can admit is 6 feet, but small craft may work through. The northern channel, or the Langö Vrid (Bend), is likewise well provided with beacons, those on the Siælland side carrying straw, and on the Möen side brooms. When the Steenkars and the west end of Langö are passed, the leading mark to the eastward will be Baagö church in one with the eastern edge of the easternmost bush on Tærö, on which mark you will pass close to the shoals on the Koster shore; but in working through, particular attention must be paid, when standing towards Siælland, to avoid the steep bank along Langö, where vessels frequently run aground for want of beacons.* The above-mentioned mark, Baagö church and the Tærö bushes, is to be followed until the west end of Nyord is in

Jungs Head. one with Jungs Head, a plain, good mark, which will serve until close to Nyord. Between Kallehave and Nyord there are

Pladen. three beacons, the first one stands on a small shoal, the Pladen, in 5½ feet water, and may be passed on either side, but by following the last-mentioned mark it is left on the port side.

Bredeö. The second beacon stands on the Bredeö reef in 2 feet water, and is to be left to starboard. And the third beacon stands on

Sælö. the generally dry and rocky shoal, the Sælö, or Schmidts Ground, and is to be left to port. Between these shoals the depth is 2 fathoms, with plenty of room for working.

Bögeström. 615. From Nyord the Bögeström, a channel of 8 miles in length, leads to the northward across the sands; it is marked by beacons, and is practicable for all vessels drawing not more than 6½ feet. Every vessel is bound to pay the pilotage, whether a pilot is employed or not, and therefore all should take pilots

---

* The last edition of the Danske Lods states, that additional beacons have been placed in this channel, to the southward of Nyord, viz.:—

On the shallow off the N.W. point of Möen,	1	beacon	carrying a broom.
On the Langö Ground, east side . . .	2	„	„ straw.
On a Knoll with 5 feet over it, to the eastward of Sælö.	1	„	„ a broom.
On the Smaa Ground, west side . . .	1	„	„ a broom.

from Nyord. Directions for the Bögeström and Ulfshale channels have been already given in the description of Faxö Bay, Articles 465 to 474.

616. To proceed from Kallehave Ferry to the southward of Lindholm, to Stege, the ferry-house is to be kept in one with Kallehave church, on which mark you leave Koster Knak, a rocky patch, with only 7½ feet water on the starboard hand; and when the village of Nyord is in one with Lindholm you are close to the beacon on the south end of Lindholm reef, which of course is to be left to port. When past this beacon the course is to be changed a couple of points more to the northward, so as to get the Barkehouse in one with Heinings Hill. The Barkehouse is a lonely building on the isthmus of Ulfshale, between its wood of stunted trees and the elevated part of Möen, on which Heinings Bank is the highest hill. By following this mark you will first pass the Kulö Beacon and then the Grale Beacon, both of which are to be left on the starboard side, as they stand at the Grale Ground, projecting off Möen, abreast of Tiönemark village, which shoals from the outer harbour of Stege. From the Grale beacon the entrance to Stege turns to the southward, along a range of beacons standing on the eastern edge of the shallow. *Stege.*

These beacons consist of bushes on the tops of poles, and are maintained by the pilots of Stege, while those about Nyord and the Bögeström are in charge of the Nyord pilots. The latter are made of bundles of pea-straw on the poles; there being no difference here, as elsewhere, between the beacons on the opposite sides of the channels. *Stege & Nyord Beacons.* *Nyord Pilots.*

617. The passage to the eastward of Lindholm, from Bögeström to Stege, together with the seldom-frequented Ulfshale channel, are completely pilot-waters.

618. The pilot establishment of Nyord is most essential to the island trade, and by means of the look-out on the island, all approaching vessels are perceived and supplied in due time.

At Stege beacon-money is paid by every vessel not taking a pilot, at the following rates:—if loaded, 4 rbsk. per com. last.; and if in ballast, 2 rbsk.; but those belonging to the town pay only the half of those dues. *Port Charges.*

CHAPTER IX.

THE LITTLE BELT.*

Limits. 619. The strait that separates the island of Fyen from the European continent is called the Lille (Little) Belt, but its exact limits are difficult to fix; we have, however, adopted a line from Æbelö to Biörnsknude for its northern boundary, and towards the Baltic a line from Poel Point on Als Island to Veis Ness on Ærö. From the Great Belt we separate it by a line from Æröshale, the south-east point of Ærö to Wor Ness, the north-west point of Taasing, and thence along the north side of that island to the town of Svendborg, which thus stands on the confines of both Belts.

Æbelö Bay. 620. The reef, extending a cable's length from the N.W. point of the island of Æbelö, may be approached by small craft within the depth of 2 fathoms, and by larger vessels according to their draught. To the westward of the island there is a deep bay trending towards the narrow, and sometimes dry, ridge by which Æbelö is joined to Fyen, and this bay, in which the depth is 5 fathoms, affords an excellent roadstead, sheltered against all winds, except those from the N.W., and they, from the narrowness of the Belt, do not raise any sea of consequence, so that vessels provided with good ground-tackle may ride there safely. To the south-west of this bay there is an extensive shallow, with a depth of 3 or 4 fathoms on its outer edge, which must be avoided by ships of the line, when coming into the Belt round Æbelö.

Bogense. 621. Vessels bound to Bogense Road, which will not admit of any drawing more than 12 feet, must pay particular attention to *Skinfel Rock.* avoid a rock called the Skinfel, with only 2 feet water, and sometimes even dry, but marked by a stake with a broom; and this may be done by keeping Skovby church, standing 2 miles inland, with trees at both ends, either to the eastward or westward of Bogense church. The outer track is to be preferred, as

* See Entrance to the Baltic, sheet 3, Great and Little Belt.

the depth close outside the rock is 3 fathoms, whereas it is only 11 feet on the inside. The crossmark for the rock is, the dwelling-house on the east end of Langö, conspicuous by a chimney, kept to the northward of Klinte, the northernmost church in Fyen, and having a very low tower as compared to the next one, Næraa church, the tower of which is high and whitewashed.

622. Bogense Road is an indifferent anchorage between the projecting necks of sand, and is but ill sheltered by the Holm shoal, on which there are 5 to 6 feet water. The worst winds here are those from N. and N.N.E., because they generally are accompanied by a lee current. The deepest water in entering to the eastward of a shoal is, by keeping the mansion of Harritslev Gaard in one with a gap between the houses in the town of Bogense, a little to the westward of the church. If the vessels do not draw more than 10 feet you may stand in by keeping the mill its own height open to the westward of the western houses of the town, or a pretty large bush with a hollow in the middle just in one with these western houses. One of these three marks is to be followed until some whitewashed stones on Fogense, to the westward of the town, are visible midway between Branholt and Hyget woods, or until Hyget Wood is in one with the Hestevang woods; or, still better, until Baaring mill, in a conspicuous position 6 miles to the westward of Bogense, is in one with the house on Fogense; then the course is to be altered to the westward, so as to bring the mill in one with the end of the northernmost wood, a short distance to the westward of Bogense, and this mark is to be continued until Harritslev Gaard is in one with the house at Bogense mill, then let go the anchor in 2½ fathoms excellent holding-ground. In entering keep the lead going, and pay attention to the light-green tint of the water peculiar to the Holm shoal. The large flat, extending to the north and eastward of the church, has in some places large rocks, and therefore should never be approached within the depth of 1½ fathoms. Coming from the westward the entrance to Bogense Road is between the Holm and the Fog Sand, a long spit projecting from Fogense. You are at the north-west end of this sand when Sandager and Bogense mills are in one, and Skovby church in one with a hollow in the middle of Brandholt Wood; and the sand may be taken close in 2 fathoms water, *Bogense Road.*

when the mansion of Gyldensteen is in one with a hedge on a cliff near the beach, a little to the eastward of Bogense church. You may then stand in, by keeping Skovby church in one with the whitewashed stones at Fogense, which mark is to be followed until the court-house in Bogense, a pretty high building, with a chimney in the middle, is in one with the road leading along the beach to the westward of the western houses of the town; this is, then, the leading mark until Baaring mill is in one with the wood, and then you may bring up as before directed. Working in through the western entrance, you may stand to the westward until the whitewashed stones are in one with Harritslev Gaard, and to the eastward until they are in one with Skovby church.

Holm Shoal. 623. The Holm consists of sand and rocks, and its reputed depth is 5 feet, but it has happened that the water has been so low as to leave some patches dry. To pass to the northward of it, keep Klinte church in one with the north end of the island of Great Stegö. The Holm affords tolerable shelter against westerly and north-westerly winds; but not against those from N. to E.N.E., which, as mentioned above, may produce a rough sea; however, owing to the inconsiderable depth, together with the remarkable good holding-ground, vessels provided with good ground tackle, may easily ride out a gale here; but on account of the foul bottom when to the westward of the line of Harritslev Gaard in one with the house at Bogense mill, chain are preferable to hemp cables.

Bogense Harbour. 624. At Bogense there is an artificial harbour, with 9 feet water, and from thence a ferry crosses to Juidsminde in Sandbierg bay, on the coast of Jutland. Authorized pilots are found here. No beacon-money is paid.

Baaring Bay. Baaring Bay, between Fogsand and Billeshage Point, is perfectly clean, with deep water close in shore.

Biörnsknude. 625. Biörnsknude Point forms the north-western extremity of the inlet to the Little Belt, and also to the Veile Fiord. Off this point, as before-mentioned (art. 185), there is a narrow rocky ridge, with only 1 to 2 feet water, extending S.E. ¼ S. to the distance of 3 cables' lengths; this reef is surrounded by a flat which stretches out S. by E. 1¼ miles from the point; small vessels may stand across this flat by the lead, but large ships ought not to stand nearer than into 6 fathoms water.

626. The projecting cape on the south side of Veile Fiord is called Trelde Ness, and its extreme point is called Kasser Point. Off this point a reef runs out more than half-a-mile to the N.E., and on the outer end of the spit there are 9 feet water, but it is surrounded by a flat, the 4-fathoms limit of which is 1¼ miles from the point. Veile Fiord is in general clean, with gradually shoaling water, within the depth of 8 fathoms, which is to be found across its mouth. Besides the reefs at Biörnsknude and Kasser Point, there are flats on the north side from off Rosenvold and Træsko Points, and on the opposite shore more extensive ones off the points of Mörkholt and Holser. The bottom on these shallows is hard sand, partially rocky, whereas, midchannel, the soundings are soft mud, and inside of Holser, seaweed. Being abreast of Rosenvold when entering, the house and high land of Holser are to be kept well open to the southward of Træsko Point, which leads close to the steep edge of Rosenvold Flat. *Trelde Ness.* *Veile Fiord.*

627. On the foul flat off Mörkholt Point, there is a patch of hard sand, with 9 feet water, called Prince Frederik Ground, and distant fully half a mile from the shore; a large ship, therefore, should not stand nearer than to 5 fathoms, nor let the point bear to the northward of W.N.W. No marks have yet been found for this shoal. *Prince Frederik Ground.*

To clear the flat off Træsko Point, which is steep-to, keep a remarkable hollow in the elevated wood north of Veile in one with the sloping part of Holser Point.*

628. Holser Reef is likewise steep-to, and to pass it, keep Veile church just open of Dros Head.† On this mark when abreast of the point, the depth is 3½ fathoms; but along the northern shore the water is deeper until off Tirsbek, where a ship of the line may find a sufficient depth. Hence it decreases gradually to 2 fathoms inside of Dros Head, from whence a channel marked by stakes is dredged out to give admittance to the harbour of Veile. *Holser Reef.*

629. Anchorages are found everywhere in the fiord when the wind is off shore, but the bottom being soft, affords but an indifferent holding-ground. Small vessels may be sheltered against N.E. winds, close inside of Biörnsknude reef in 3 fathoms water, with tough clay bottom; and there they are ready either to pro- *Anchorages.*

* View 34. † View 35.

ceed out or run up the fiord. The bay inside Rosenvold affords good anchorage to vessels of any size, with north and easterly winds; but in a southerly or south-west gale, this roadstead is rather unsafe, on account of its loose and muddy bottom.

The only secure road in the fiord, sheltered against all winds, is Ankiær Vig, inside of Holser Point, but only small vessels can run in sufficiently behind the point; ships are obliged to keep farther out, and to such it is recommended to pay out plenty of cable when the breeze increases, for, owing to the abundance of seaweed, the anchor is apt to drag.

Pilots. 630. In the town of Veile there are pilots well acquainted with all the localities of the fiord, for they place and maintain 40 dif-
Port Charges. ferent beacons there, and are entitled to 2 rbsk. per com. last. for every vessel not employing a pilot, whether inward or outward bound; except those which belong to the town, and which pay only half the beacon-money. The harbour at Veile admits vessels only drawing 10 feet.

The Narrows. 631. From Kasser Point to Fredericia, and from Staur Head to Striib Point, the opposite shores of Jutland and Fyen converge towards each other, so as to form the strait called the Narrows of the Little Belt.

The shallow along shore is of small breadth on either side, particularly at Striib Point, though rather larger on the opposite shore at Skandse Point, off which it forms a short reef. Off
Gryde Ness Bank. Gryde Ness and parallel to the shore of Jutland, there is a ridge of sand with 20 feet on its shoalest part, as may be seen in the chart. The bottom round it is clay, and the depths irregular.

632. The Narrows commence at Skandse or Battery Point, and Striib Point; and terminate at Stenderup Point. Out of these
Current. narrows runs a stronger current than is found in any other part of the Danish seas; and when it is opposed by a N.E. wind, the sea is so high, short, and irregular, that even the anchorage at Fredericia is unsafe. Under such circumstances, vessels anchor to the southward of Striih Point, although the shallow there is rather steep; this, however, is an advantage with a southerly wind, and this anchorage in 4 to 6 fathoms water is safer than that at Fredericia. There is, nevertheless, a
Mölle Bay. still better anchorage in Mölle Bay, to the southward of Fredericia, but the depth being only 2 fathoms, it is available only to

small vessels. The holding-ground is excellent; it is sheltered against all winds, and it lies inside the course of the strong current, and is therefore much frequented; and not only for these reasons, but on account of its vicinity to Fredericia, where there is a custom-house and pilots, who take vessels to all the places between the island of Thunö and the town of Sönderborg, in the island of Als.

633. When coming from the northward, and standing in for the anchorage in Mölle Bay, the only danger to be avoided is the flat off Skandse Point, which may be cleared by keeping the highest part of Krybskov, a wood in a an elevated position to the N.W. of Middelfart, so far within the point of Striib, that the distance from the wood to the houses of Striib, is a quarter of the distance from the houses to the point. Keep on this very distinct mark until the Tolbooth of Fredericia is in one with Skandse Point, and you are then past the flat, and may steer for the anchorage, the S.W. part of Skandse Point being steep-to. From thence to the southward the depth suddenly increases to 15 and 20 fathoms along the Jutland side, whereas, in the mid-channel, until close to Striib, there are only 10 to 12 fathoms.

Fredericia.

If the intention is to stop at Fredericia, you must anchor abreast of the pier-head, and not more to the westward, on account of the rocky bottom and the less shelter that will be afforded by Striib Point against southerly winds. Large vessels bring up in 12 to 14 fathoms, smaller ones in 8 to 10, and it is advisable to run out a warp to keep the anchor clear; but as the ground is very sloping, the anchor is apt to come home with northerly and easterly winds; and as there are neither dolphins nor rings for making fast the warp, the anchorage is rather unsafe. In a southerly gale there is not room to veer out sufficient cable, and therefore this place can only be recommended to vessels drawing less than 12 feet, that being the draught with which the harbour may be entered; for both the swell and the sea in the road will be found troublesome and dangerous.

Fredericia Harbour-Light.

On the northern pier-head of the harbour there is a lantern and fire and candles are allowed on board.

Pilots.

The pilots ply to Thunö, Rudkiöbing, and Femern Sound, and they only are entitled to carry ashore such masters of vessels as do not choose to use their own boats. Every passing vessel is bound to pay the duties and to hoist their colours to the Castle.

Mölle Bay. 634. In Mölle Bay the ground is less sloping, and accordingly the anchorage is safer in westerly and northerly winds; and as the current from the southward does not run so far in, but forms an eddy, sweeping along the shore to the southward, it lessens the stress on the cable during a southerly gale. On the western side of the bay there is a flat, and on the northern side a reef, and between them but little room; so that it is best to anchor on the flat, in 2 fathoms, where about 16 vessels may find sufficient space. The flat lies very near the shore, bearing about S. by E. from an irregular yellow cliff, close to the beach; and the mark for the anchorage is to bring the extremity of Staur Head in one with Skandse Point, so as to shut in the opening, when the depth suddenly changes from 6 to 2 fathoms. You will be to the southward of the reef and the flat by keeping Staur Head thrice its own height to the southward of Skandse Point. The anchorage to the southward of Striib is in 6 to 8 fathoms, and so near the shore as to have the flag-staff on the Castle open of Striib Point. The ground here is somewhat less sloping than at Fredericia, but yet too much so to be safe in a gale from N.E. or S.S.E., in which last case the wind and current generally act in the same direction; and yet this anchorage has the advantage of being entirely free from swell.

Striib Reef. 635. To the N.W. of Striib Point there is a short reef, the spit of which may be crossed in 4 fathoms by keeping the small spire of Middelfart church just to the westward of a little white house on the beach, to the northward of Löngs Point. From Striib a ferry crosses to Fredericia. Somewhat farther in, close to the shore of Fyen, there is a small shoal, immediately to the northward of two small, conspicuous hillocks in the vicinity of Rubek water-mill, and it is cleared to the westward by keeping the western angle of Fredericia ramparts well to the left of Striib Point.

Löngs Point. 636. The shallow along the shore of Jutland diminishes in breadth towards Löngs Point, close to which the water is deep; and the inconsiderable shallow shoal off it may be cleared by keeping the south-eastern mill of Fredericia to the eastward of the high land of Striib Point. Close to the southward of the point there is good anchorage on a flat, in 2 to 4 fathoms, and abreast of the fishermen's houses; the holding-ground is excellent, the waters smooth with all winds, and the ground less sloping

than at Striib. Eight small vessels may find room there; but a couple of cables' lengths to the westward of the point the bottom is rather foul.

637. The shore at the small town of Middelfart is steep-to, and vessels anchoring there were obliged to ride by a hawser from the shore with southerly winds; but now the harbour has been so much improved and enlarged as to admit vessels drawing 11 feet. Either from this harbour or from the Kongebro pier, a little to the north-westward, near the wood of Kribskov (according to the direction of wind and current), a ferry crosses to Snoghöi; and this is the principal ferry-place across the Little Belt. *Middelfart.* *Snoghöi Ferry.*

638. Between Middlefart mill and Seibierg there is a narrow and steep ridge, with 6 to 8 fathoms across the Belt; but this shoal is too narrow and too steep to afford any anchorage. The marks for it are, a house, Ravnegaard, visible in the cliff, and the church in Fredericia in one with Löngs Point. From thence both sides of the Belt are clear of any danger until off Gals Cliff, where a flat projects half a cable's length, and offers an excellent stopping-place in 3 to 5 fathoms, on a clay bottom. *Seibierg Ridge.* *Gals Cliff.*

639. Between Gals Cliff and the north end of the island of Fænö there is a large detached bank, the Flessing, with only feet water where shoalest, but affording anchorage for small vessels in 2 or 2½ fathoms, with excellent holding-ground, though in the strength of the current. On the north and east sides it suddenly rises from 8 to 3 fathoms, but with a gradual slope on its south-west side, where it is joined by a 6-fathoms flat, to the small island of Fænö Kalv. In the channel between it and Jutland there are 20 fathoms water, and on the Fyen side, 8 to 10 fathoms; but the narrow passage between the shoal and a flat extending from the north end of Fænö, called Fænö Tange, has only a little more than 4 fathoms. A floating beacon lies on the Flessing, in 8 feet water, carrying a red ball on a white pole; and to pass it to the northward, bring some trees on Löngs Point in one with Gals Cliff. On the south-west side there is good anchorage in 2 to 3 fathoms water. No conspicuous marks have been yet found for the passage between the shoal and Fænö Tange; but another mark to pass to the northward of the shoal is, Gals Cliff in one with the east end of a cliff situated about 600 feet S.E. of the Sönderskov House, and North Köies Point of Fænö in one with the N.E. point of that island. To *Fænö Island.* *Flessing Shoal.* *Flessing Beacon.*

pass it to the westward, keep Stenderup Point open of the western wood on Fænö.

Distant a little more than a cable's length to the northward of Fænö there is a small bank, with least depth of 4½ fathoms, yet large vessels ought not to cross it; they should rather avoid all danger by bringing the eastern side of a cliff standing midway between Sönderskov and Snoghöi in one with Gals Cliff, until Stenderup Point is open of the western wood on Fænö. Whichever of the above cliffs is used as the mark, you ought not to deviate to the southward before the west point of Fænö Kalv bears S. by W. ½ W., then steer in that direction until the point of Tonnes is in one with the south-west point of Fænö, which is the leading mark between the Flessing Shoal and the Kalv.

Kolding Fiord. 640. Abreast of the Flessing Shoal the mouth of Kolding Fiord branches to the westward from the Little Belt. On the north side of this branch there are two creeks, Eltang and Gudse; the former being very shallow, and the channel into the latter being only 20 fathoms wide where it passes to the eastward of the Kidholmes, and of Hvense Point, which terminates the neck of land called Houens Odde. Between the Kidholmes and Stagenaf Point there are but 10 or 11 feet water, but farther in the channel is deeper, and the *holding*-ground is good, clay and mud. The rest of Gudse Creek, on both sides and up towards the small rivulet, is, like Eltang Creek, very shallow, having only from 1 to 2 feet water in many places. Gudse Channel is an excellent winter harbour, and was formerly used as such by the vessels belonging to Fredericia.

Aitrup Bay. 641. The fiord forms Aitrup Bay on the south side, between Skare and Loger Points, and opposite to Dreien Point. In the channel or inlet there is a depth of 5 to 7 fathoms, but with so many sinuosities, that it is impossible to give marks for its navigation, first trending S.W. by W., then W., then N.N.W., and finally again W. until some distance within Loger Point, where it ends in the depth of 4 fathoms, and being in several places only 200 feet wide. Large vessels, therefore, can go only a short distance inside of Skare Point, and even so far the inlet is narrow; but the bottom being soft on both sides, there is no danger in touching the ground. Farther out, but just inside of Borup Point, which is steep-to, there is a flat wide enough to afford an excellent summer anchorage to vessels of any size, in a

depth of 6 to 8 fathoms. Outside of that point the depth is much greater, and vessels are exposed to a violent current. Small vessels bound up the fiord are advised to keep close to Skare Point, in order to avoid a reef, extending to the southward from the Kidholmes to a distance of 3½ cables' lengths; but the spit of this reef may be passed in 10 feet water, by keeping Borup Point in one with the southernmost woody hummock at Hindsgavl, in Fyen. The best channel up the fiord is at present nearest to Dreien Point, although a reef extends therefrom, the end of which is passed when Dyrehave Gaard (a small mansion) is open to the southward of the wood to the eastward of the Strand Houses; and you are abreast of the reef when the two eastern-most prongs of Dreien Point are in one. When past this mark, bring Kolding church in one with the gate of the Castle (in ruins), and proceed in this mark according to the draught of the vessel. This fiord is so shallow that vessels drawing 14 feet can only proceed as far as within half a mile of the Strand Houses, abreast of them there being only 10 or 11 feet water. To the westward of them vessels drawing 8 feet may obtain a safe winter berth, to which those belonging to Kolding used to resort, until a harbour was, after much labour, constructed near the town, and dredged out so as to admit vessels drawing 10 feet. *Kolding Harbour.*

The holding-ground is good where the depth is more than 3 or 4 fathoms, mud and clay; but where the depth is less, the seaweed prevents the anchors of small vessels from taking a good hold.

642. The islands of Fænö and Fænö Kalv (Calf) lie in the mid-channel of this narrow Belt. Kalv is surrounded by a small flat, but so steep-to that it does not afford any anchorage. The shallows off Fænö have some breadth, especially its north end, where the flat called Fænö Tange offers a preferable stopping-place to that on the Flessing, because it is out of the track of the current; the bottom is clay, and the depth 2 or 2½ fathoms; it is much frequented by coasters. *Fænö and Fænö Kalv.*

643. Off North Köies Point there is a short reef, which is steep-to on its south side; it is passed by keeping Tavlov church twice the height of the shore on which it stands, outside of the north-east point of Fænö. About 2 cables' lengths to the south- *North Köies Reef.*

ward of this point, and 1 cable's length from the shore, lies a small patch, with 15 feet water.

South Köies Flat. 644. Off South Koies Point a flat extends a cable's length; but to the southward of the N.E. point of the island the shore is so steep-to that small craft frequently heave down there with the purchase-falls ashore. Somewhat farther south, to the north of North Köies Point, in Lenkevig Bay, some piles form a winter harbour, out of the track of the current and of the drift ice.

Flessing. Shoal. To pass to the eastward of the Flessing, and between Fænö and Fyen, coast along the latter about 2 cables' lengths off. North Köies Point in one with the north-east point of Fænö will lead clear of a flat extending from the Slotsbanke; and a farm, called Rasmus Jörgens Gaard, in one with the point to the S.E of Hindsgavl, clears Fænö Tange.

645. The sound between Fyen and Fænö, called Oieness Sound, or Troldslykke, has 10 to 17 fathoms water, and the shores on both sides may be approached within a cable's length, and even less.

Oieness Sound. The position of Gamborg Fiord or Frith, being a continuation of Oieness Sound, and containing deep water, leads the porpoises sometimes to mistake this fiord to be the Belt; in autumn, therefore, boats are on the look-out for them, and many are caught in nets, at the point of the peninsula of Fönskov.

Gamborg Fiord. The depth is 9 fathoms in the mouth of the fiord, but gradually diminishes throughout its length; in the mid-channel there are 4 fathoms as far as Svinö; and inside of Tolben Head the bottom is clay, so that the fiord would make an excellent winter harbour for ships of any size.

Fönskov Reef. 646. From Fönskov Point a nearly-dry reef projects to the distance of a couple of cables' lengths to the northward; and its north and west sides are perfectly steep. To pass to the eastward of the reef into the fiord, bring the western chimney on Hindsgavl in one with a small bush on North Köies Point; and to the northward of it Hollænder Gaard must be in one with a remarkable tree on Fænö. To run through to the westward of the reef, bring Middelfart mill in one with the west end of Hougsgaard.

Stenderup Flat. Off the opposite point of Stenderup, a pretty large flat ex-

tends toward south and south-east: vessels of all sizes may approach it until Tavlov church is half the breadth of the Kalv, to the eastward of that little island; and you are abreast of the eastern elbow of the flat when Middelfart church is in one with South Köies Point, or open of Fænö Wood.

647. To the southward the Belt expands, and the current accordingly is weaker, but yet strong enough to have cut, since 1801, a channel, of 8 to 10 fathoms in depth, through a flat, which at that time had only 17 feet. *Current.*

648. Mid-channel is the Flæköie, consisting of some shallow patches; and a shoal which extends N.N.E. and S.S.W. two-thirds of a mile, with a breadth of 2 cables' lengths, and consisting of hard sand. Along both sides there are shelves, with 15 feet water, between which it is deeper. A small bank to the S.W. of it carries 16 feet, and between them runs a narrow 7 fathoms' channel. Farther to the southward there are two patches, with 21 and 23 feet water; and away to the westward, near the shallow off the main shore, to the south of Stenderup Point, a small patch with 19 feet. *Flæköie Shoals.*

649. Between this western patch and the Flæköie Shoals lies the western channel, through which the leading mark is the same as that to clear Stenderup Flat; viz., Middelfart church in one with the S.E. point of Fænö; but as this mark leads rather too near the western patches of Flæköie, it is better to keep the church just hidden behind the point of Fænö, and to steer S. by W. ½ W. in 8 to 12 fathoms, soft bottom. On its eastern side the large Flæköie is very steep, rising from 5 fathoms to 16 feet, where Middelfart church is in one with the extreme point of Fönskov. In this eastern channel there are from 12 to 20 fathoms water; but after passing Stenderup Flat, do not stand more westerly than Tavlov church in one with the extreme point of Stenderup, as this mark will avoid the north-east end of Flæköie Shoal, and all its shallow patches, by leading through in a depth of 8 fathoms. Towards the Tonnes Point Reef, which is steep-to, and along which the current has cut the deepest water, you may stand in till Tavlov church is in one with the east side of the Kalv. Being on one of these marks, or between them, and seeing the tall trees which stand to the southward of the lighthouse on Aarö Island in one with the eastern edge of Brandsö Wood, you may follow this latter mark, and steer about S.S.W. across the wide part of the Belt (called the Bredning), towards Brandsö. *Western Channel.* *Eastern Channel.* *Tonnes Reef.*

The Bredning. 650. The Bredning forms a large and well-sheltered road, with a convenient depth, nowhere exceeding 13 fathoms; but towards the Jutland shore it is shoaler, and the bottom there consists of very deep mud, through which the anchor has to sink before it can take hold in the clay below. Ships of all sizes may pass on either side of Brandsö, but the best and deepest channel is to the eastward of that island. On the Fyen shore there are two bays; *Fönse Vig.* the Fönse Vig and Tybring Vig, on each side of Aale Head; and both of them are good stopping-places for vessels choosing to lie out of the current. Fönse Bay is perfectly clean, whereas in *Tybring Vig* Tybring Bay there is a flat, which may be approached by the lead. These bays are, however, but rarely frequented, except by vessels *Aale Head.* loading there. From Aale Head a flat extends two-thirds of a mile, with sand and seaweed; and, on its inner part, rocks to the distance of 2 cables' lengths from the shore. You pass outside this flat, in 6 fathoms water, by keeping Tavlov church midway between Stenderup Point and Fænö, and you will cross it in 11 feet water when Tavlov church is just visible to the westward of *Vedelsborg Head.* Tonnes Point. The shallow round Vedelsborg Head is of smaller extent, and very steep-to, from 4 fathoms water; in which depth it is just cleared by keeping the eastern edge of Sparretorn Wood in one with the point of Aale Head;* and the south-western extremity of the shallow is passed with Assens church and the north-east point of the island of Baagö, in one.

Slesvig Shore. 651. Along the Slesvig shore, to the southward of Stenderup Point, the shallow is narrow, and consists of sand and seaweed; but outside, in the depth of 4 or 4½ fathoms, the bottom is too soft to afford a good holding-ground with a south-east wind. The inner- *Mos Vig.* most part of the bay of Mos Vig, to the westward of Moes House, is a much-frequented place for shipping wood. It may be entered by following the shallow along the shore from Stenderup Point, but not within the depth of 4 fathoms, in order to avoid a neck of the shallow, between Skilting Gaard and Moes House, which, at the distance of 4½ cables' lengths, is steep, from 4 fathoms to 16 feet water.

Vargaard Head. 652. From Vargaard Head to the southward the shallow off shore is somewhat wider, but abreast of Vargaard it is remarkably steep, rising from 4 fathoms to 9 feet, with a rocky bottom. In the bay formed by the above-mentioned point and Gravens Head, is the *Heilsminde.* entrance to the basin of Heilsminde, a shallow sheet of water,

* View 36.

with water only for small vessels. The inlet is very narrow, with 7 to 8 feet water along the south side; and inside, vessels drawing 6 feet may anchor close to the northern shore.

653. Nearly in the middle of this wide part of the Little Belt is the island of Brandsö, with reefs from its N.E. and S.W. angles, of half a mile in length; but the shallows on both its sides are only 2 or 3 cables' lengths wide, though very steep. The north-east reef is the shallowest, but some of its dry rocks may be plainly seen, nearly out to its extremity. It cannot be approached by the lead, but it may be passed a third of a mile to the northward, by keeping Huusby church open to the northward of Vedelsborg Wood. *Brandsö.*

The south-west reef has fewer rocks; but on two-thirds of its whole extent there are only 1 to 3 feet water, and 6 to 10 on the rest of it: it is steep-to from 6 fathoms, and ought not to be approached within 7. At the distance of 65 fathoms from the south point of the island there is a remarkably large rock. The shallow along the eastern side is likewise rocky to 1½ cables' lengths from the beach. The only house on the island is on the south side, and abreast of it, at half a cable's length from the beach, there is a stone pier 90 feet long, and 5 feet above water; and inside of it a good boat-harbour, with 3 feet water. One or two cables' lengths outside of this pier the best anchorage will be found in 12 feet water; and it may be taken by vessels from the westward, if drawing 9 feet, by standing across the flat on the mark, Udby and Föns churches nearly in one, and kept well open of the east point of Brandsö. *Baadehavn, or Boat Harbour.*

654. Abreast of Brandsö, off Anslet Point, there is a considerable flat of sand, on the outer end of which the depth is 10 to 12 feet. To pass outside this flat Middelfart church is to be brought in one with the west point of Brandsö, which mark likewise clears Knudshead; but, as it is only visible in clear weather, another mark is, to keep a remarkable cleft, or hollow in the wood at Moes House, a little open E. of Vargaard Head. A remarkable rock near the shore may serve to show when the reef is passed. *Anslet Point.*

655. Nearly S.E. from this flat is the insulated shoal called Knudshead Ground, the passage between which reef and Anslet Flat is 3 quarters of a mile wide, and the least depth on the shoal is 3 fathoms, rock and gravel. From a little outside of Gravens Head the roof and two white chimneys of a farm-house may be seen standing behind a yellowish cliff near the beach, to the northward of *Knudshead Ground.*

Heilsminde; and Heils church close to the east of this roof, when Föns and Udby churches are in one, and a little outside of the east point of Brandsö, marks the shoalest part of the Knudshead shoal, wherefore, if a vessel requires a greater depth than 3 fathoms, she must not bring those objects in one simultaneously.

Aune Vig. 656. The creek of Aune Vig, to the southward of Knudshead, is very shallow and inaccessible; and between this creek and Iörget Point, the north point of Haderslev Fiord, the shallow, consisting of sand and grass, forms the Orby Flat, on which the limits of 4 fathoms water are more than a mile off shore, so that it ought not to be approached nearer than to bring a bush on the island of Aarö, north of the village, in one with the western side of the small island of Linderum. You may then pass across this sandy neck, in 16 feet water, with Aarö Vold (Mound) in one with the eastern side of the village on the same island. Tamdrup Hill, right over the wood at its foot, or Tamdrup farm over an open plain to the northward of it, are also marks for clearing Iörget Point, and for crossing Linderum Flat in the deepest water.

Linderum Flat. 657. Coming from the southward across Linderum Flat, on any of the marks for that passage, you must steer N.E.‡ E. when Assens church opens N. of Bastholm, and you are past the Orby Flat, when, as mentioned above, the bush on Aarö comes in one with the western side of Linderum. This small island is united by a flat to the shallow of Iörget Point, which is a neck of sand extending S.E. by E. to the distance of a mile, and forming the north side of the mouth of Haderslev Fiord. The south side of the fiord is formed by a shallow which extends from the shore in the direction of Iörget Point, and which to the northward and eastward is steep from deep water to 9 feet. Between these shallows there is a narrow and intricate inlet, with 7, 5, and 4 fathoms water outside of Iörget Flat, and with 19 feet inside of it; but this inlet which is steep-to on both sides, and very crooked, ought to be marked by beacons to be made easily navigable. Vessels not drawing more than 12 feet may enter the fiord by keeping Kiærum church on Fyen in one with the north end of the high land of Aarö, which will lead between Iörget Reef and the Knudeground, a patch with 8 feet water on the southern shallows. Small vessels coming from the southward through Aarö Sound may pass inside of the Knudeground, by the lead along the shore shallow; then bring the south-west point

Linderum Island.

Haderslev Fiord.

of Aarö just open of Aarö ferry-pier, and steer N.N.W. on this mark until Kiærum church comes in one with the north-east point of Aarö, which mark then is to be followed until Knuds Head is nearly in one with the outermost house to the northward of Iörget Point; and finally, steer N. ¼ W. towards that point till within a cable's length of it. Haderslev inlet trends N.W. ¼ W., past a small buoy, which is to be left to the southward; while on the north side, inside the point, stand two piles, in 5 feet water. Between them and the buoy the water is 18 to 20 feet in depth, and there vessels may anchor that are too deep to proceed farther up the fiord, and consequently are obliged to use lighters to load or unload. Farther in, beacons are placed along the south side, up to Stevelt Point, and at the same side, in the wider part of the fiord, called the Leddet, there is a small buoy, from whence it is so narrow, sinuous, and shallow, that only vessels drawing 7 feet can get up to the town of Haderslev at present, but it is to be dredged out to the depth of 8 feet. The town of Haderslev is in a flourishing condition; the adjacent country is fertile, with an increasing trade, the custom-house for which is at Stevelt, as well as a landing-pier. The beacon money is 8 rbsk. pr. com. last, and 4 rbsk. for vessels belonging to the town.

Iörget Road.

Stevelt.

658. The Little Belt contains several islands, Brandsö, Baagö, Aarö, Linderum, &c., and thereby forming several channels, of which vessels may take their choice: the Hovedlöbet, or Main Deep, between Fyen and Baagö; Aarö Sound, between Slesvig and Aarö; the Fyre Rende, or Lighthouse Channel, between Baagö and the flats and shoals to the eastward of Aarö; and finally, for vessels not drawing more than 12 to 13 feet, a fourth channel, across the flat of Linderum, between that island and Slesvig, and leading into Aarö Sound.

659. In the Main Deep the shallow along the shore of Fyen is only 2 to 3 cables' lengths across, except in the bay at Emtekiær Nakke, where it is half a mile wide, as well as off Baagö and the small island of Ægholm; and round these islands it is also remarkably steep from 4 to 2 fathoms. To pass to the northward of Ægholm Flat in 4 fathoms, bring Oesby church in one with the conspicuous hill of Tamdrup, both in Slesvig. Between Baagö and Ægholm there is a boat-channel with 5 feet water.

Main Deep.

Rem Shoal. 660. To the eastward of Baagö, in the Main Deep, lies the Rem, a long bank, separated from the shore shallows by a narrow channel with 6 to 7 fathoms water; this bank, or rather shoal, is nearly 2 miles long, and to the southward a third of a mile wide, with 12 feet least water. On its eastern side it is very steep, from 6 fathoms to 15 feet, and accordingly cannot be approached by the lead. To the southward of Baagö, and along the eastern side of Aarö, the shallow is nearly a mile in breadth; while on the opposite shore the channel is narrowed by the Asness and Thorö Reefs, off which the 4-fathom limits of the shallow extend 2 miles from the shore. The shallows along Baagö and Aarö are very steep-to, but not so on the Fyen side.

Main Deep. N entrance. 661. To enter the Main Deep from the northward with a large ship, Assens church is not to be opened to the eastward of Baagö till well round Vedelsborg Head; then shape a course between Ægholm and Fyen, but rather nearer to the latter, as its shallow is more gradual, and then keep the high hill of Skamling-bank, on Slesvig, midway between Brandsö and Vedelsborg Head, until Huusby church is in one with the westernmost house in the village Sönder Aaby,* on which mark it is requisite to be, when Barlöse church, standing in a conspicuous position, is in one with the much lower church of Sandager. Then steer about S.S.W., between Fyen and the Rem shoal, and when Sandager church is well in upon Bille Wood, or bearing N.E. by E. ½ E.,† the course is to be changed to S.W. by W. ½ W., and this last mark becomes then the leading one through the channel. But in order to take the mid-channel, from the time that Kiærum and Assens churches come in one, until the eastern edge of the wood on Brandsö is in one with the south-west point of Baagö, steer S.W. by W. ¾ W. This is the narrowest part of the channel, and when past the north-west spit of Thorö Reef, bring Sandager church again to bear N.E. by E. ½ E. until the westernmost corner of Vedelsborg Wood is in one with the lighthouse on Baagö, which mark, leading about S. by W. ½ W., will clear to the westward all the shoals and *Lille Ground.* patches. This mark will also clear the Lille Ground, which none but ships-of-the-line need avoid, for it consists of two patches, with not less than 4 fathoms water, with the following marks: Aarö Sound just shut in, and the eastern edge of Vedelsborg Wood

* View A. in the Chart. † View B. in the Chart.

in one with the south-east point of Baagö. To pass to the eastward of it, bring the western edge of Vedelsborg Wood in one with the western side of the village on Baagö. A large ship, coming from the southward, ought to be on this last mark by the time that Dreslette church is in one with a remarkable depression in Frederiksgave Wood.* When Oesby church is run behind Baagö, you may steer N. ¼ W. in the mid-channel, instead of following the mark above given, of Huusby church in one with the westernmost house of Sönder Aaby; and afterwards N.W. by N., and N.W. in the direction of Skamlingbank, hugging the northern shore until the eastern edge of Sparretorn Wood is well open to the westward of Aale Head cliff,† when the course may be shaped to the northward, clear of the shallow off Vedelsborg Head.

662. The depth in the Main Deep is from 8 to 19 fathoms, but just where the shallows of Aarö, Thorö, and Raagö approach each other it is only a third of a mile across, and very steep-to on both sides. The marks are, nevertheless, so conspicuous, and the floating beacons off Asness Spit, Thorö Reef, and Aarö Kalv so distinct, that the channel may be easily navigated with a leading wind; which is, however, but rare, on account of the sinuosity of the channel.

To the southward of Vedelsborg Wood there is a wooden pier, with 4 to 5 feet water at its head; but a cable's length farther out 11 feet will be found, on a gradually-sloping ground; and vessels anchor there to load. *Vedelsborg Pier.*

663. In the mouth of a small rivulet at Sönder Aaby, and farther to the southward, at Aborreminde (the estuary of a large sheet of water), the depth is only 2 feet; from whence to Assens the narrow shallow is all hard sand. West of Assens there is a small peninsula, called Asness; and off its north end a spit of sand and seaweed shoots out nearly a mile, carrying from 2 to 10 feet, when it soon deepens to 4 fathoms. This spit affords shelter to Assens Road, outside of the town of Assens. *Asness Spit.* *Assens Road.*

At the end of Asness Spit there is a beacon in 9 feet water, with a black pole and one broom. Vessels drawing 12 to 14 feet may stand across this spit, as well as Thorö Sand, by keeping a remarkable hollow in Bille Wood in one with the middle of *Asness Beacon.*

* View 37. † View 36.

the third steep cliff near the beach, to the northward of Assens. With Sönderby cliff open to the westward of Asness, the north end of Asness Spit may be crossed in 14 feet water.

664. Bound for Asness, you may coast along the eastern shallow by the lead; but if drawing more than 10 feet, do not stand nearer to the western side of the spit than into 3½ fathoms on the mark of the western edge of Vedelsborg Wood well open of the eastern shore of Baagö, till the easternmost windmill of Asness, is visible to the northward of the church; then you may steer E.N.E. across the end of the spit, in 3½ fathoms; and when the easternmost of the Thorö houses is seen inside of the north point of Asness, the course will be S. by E., in the direction of the church. You may anchor in a convenient depth, the mark for the deepest water in *Assens Road.* the road being the southern mill of Asness seen just outside the pier-head of the harbour; and the eastern mill, just behind the church. The depth there is 14 feet, on tolerable holding-ground; but with northerly winds the sea may be found rather rough.

Vessels drawing 10 feet, when Assens church is to the northward of the north point of Asness, may stand along the western side of the reef so near that the easternmost of the Thorö houses is in one with the steep S.W. point of Asness; and, if so far to the northward on this mark that a white gable with a black shutter is visible to the northward of the rest of the houses in the town, you may stand across the spit on this mark until Thorö houses are open to the eastward of Asness, and then steer S. ½ E., towards the pier-head.

Working in, with a vessel drawing 10 feet, you may approach the shallow between the Fulling-mill and the town until the easternmost of the Thorö houses is in one with the pier-head; and when so far to the southward as to bring the eastern mill behind Assens church, the eastern side of the reef is not to be approached within the mark of the westernmost of the Thorö houses, entering on Asness. The depth decreases in proceeding to 12 and 11 feet, and abreast of the harbour there are two buoys, one N.W. by N., half a cable's length from the pier-head, in 11 feet; the other S.S.W. from the former, in 8 feet; and warping-posts *Assens Harbour.* in 7 to 9 feet water. From the north buoy the course is S.E. by S. until the harbour opens, when it bears E.S.E. The harbour's mouth is 40 feet across, and the depth 11 feet, and farther in along the quays 9 to 10 feet; but this is to be increased to 11

feet, and the entrance to 14 feet.* Fire and candle are allowed in this harbour. Skilful pilots are stationed there; and the town is thriving from the brisk corn trade it carries on.

665. Three Fixed Lights assist the navigation to this port, one on Baagö, one in Aarö Sound, and one at Assens; the former is lighted every night, but the two others are only for the use of the mail between Hamburg and Copenhagen, while crossing the Belt in a steam-vessel. *Lights.*

Baagö Light, which is 39 feet high, stands in a square, white-washed turret, on the south-west point of the island, and is visible in all directions 10 miles distant, except when bearing S.W. by W. and hidden by the village. The Aarö Sound Light is inside the harbour, and a lantern is lighted on the southern pier-head when the mail is expected. The Assens Light is placed over the town gate, and is concealed by the custom-house while between the bearings of E. by S. and E. ¼ N. *Baagö Aarö, and Assens Lights.*

666. To the southward of Assens the coast of Fyen forms another small peninsula, the Dreiet, abreast of which stands the island of Thorö, surrounded by very extensive reefs and flats. *Dreiet Peninsula.*

667. Between the dry neck of sand which projects from the east point of Thorö Island, and the long sand-bank, carrying from 4 to 6 feet water, extending from the north-east point of Dreiet, lies Thorö Sound, very narrow and tortuous, and admitting only vessels drawing 10 feet, owing to an 11-feet bar at its southern entrance. Having passed the above-mentioned sand-bank, which is easily distinguished by the tint of the water, the channel leads close along the north-west point of Dreiet, with a depth of 5 fathoms, and from thence the course is S. ¼ E., in order to pass outside of a reef that juts out two-thirds of a cable's length from the beach. From this reef the course towards the bar is E.S.E.; then coast along the beach at the distance of half a cable's length, until Assens church is in one with Thorö houses, and steer on this mark S. by W. ½ W. across the flat in 11 feet water at least. *Thorö Sound.*

In the cove to the eastward of Dreiet there are 10 to 12 feet water, on mud and weed; and the fishing-smacks belonging to the place make fast to mooring-posts. *Dreiet Cove.*

668. The bay between Asness and Thorö, which forms the *Thorö Road.*

* It is intended to construct a new harbour to the southward of the present one.

north entrance to Thorö Sound, is an excellent roadstead. In running for it from the westward, keep Assens church in one with Brahesborg, a conspicuous old mansion covered with red tiles, which mark clears the Thorö shoals to the northward in 16 feet water, and when the western edge of Vedelsborg Wood is well open to the eastward of Baagö, steer S.S.E. between Asness and Thorö, dropping the anchor as Assens church comes in one with the western mill in 3½ fathoms sand, but good holding-ground.

669. To the southward and westward a broad shallow, with sand and seaweed, stretches off Thorö, and gradually deepens to 4 fathoms, 1½ to 2 miles from the island. This flat is often resorted to by the coasters; and vessels not drawing more than 8 feet may from thence stand across Thorö Shoal in not less than 9 feet, by keeping the eastern point of Brandsö just open to the westward of Baagö lighthouse. Vedelsborg Head, in one with the western side of Baagö village, will conduct them across the flat in 2 fathoms; and the eastern edge of Vedelsborg Wood, in one with the south-east point of Baagö, leads across in 3 fathoms water. On the western extremity of Thorö Shoal, in 16 feet water, there is a floating beacon, with one broom on a white pole, Baagö lighthouse bearing N. ¼ W., and Assens church E. ¼ N.

Thorö Flat.

Thorö Beacon.

670. The greatest attention must be paid to the violent and irregular currents in all these tortuous channels; so much so, that in light winds it is often requisite to drop an anchor, which may be conveniently done on the Rem, as well as on the shallows off Baagö, and especially on Baagö Flat to the southward of the island, but avoiding the Sandhammer Shoal. When Huusby church is in one with the south-east point of Baagö, and Kiærum and Assens churches are in one, it is necessary to steer N.W. by N., and then N. ¼ E., in 12 to 15 feet water, when you may come to an anchor 2 cables' lengths off the beach, with the lighthouse bearing W.N.W. ½ W., and sheltered against all winds except those from S.S.W. to S.S.E. Good anchorage will be found to the northward of Baagö, on either side of Ægholm, though less good to the eastward, as the flat is both shallow and steep; but on the western side you may stand in, by keeping Barlöse church in one with a single tree, on the north side of Baagö, until Huusby church comes to the eastward of Ægholm; then stand in on this mark N.E. by E. ¼ E., and anchor in 2

Currents.

Baagö Flat.

Ægholm Anchorage.

fathoms before Barlöse church opens N. of Baagö. There is a passage for boats across the flat, in 5 feet water, close to the point of Ægholm; and off Baagö there are some posts, standing in a foot water, to which the boats belonging to the island make fast.

671. The Lighthouse Channel (Fyr Renden) is very narrow and intricate, leading between Baagö and Aarö, and through their surrounding shallows, and ought not to be attempted, except on extraordinary occasions, though it has sufficient depth for ships of any size, with only a single patch of 23 feet near its northern entrance. It is very steep on both sides; from deep water to 2 fathoms; particularly in the bend, where it is not a cable's length across. The shoals which bound this channel are on the north side—the Baagö Flat and the Sandhammer, a neck of hard sand, extending S.E ½ S. from Baagö lighthouse to the distance of 7 cables' lengths; the inner half being nearly dry, and the rest with 7 to 11 feet at its point; and perfectly steep from 4 fathoms on the mark of Kiærum church in one with the easternmost of two mills, standing close to the southward of Assens. The south side of the channel is also steep-to, though less so, and Kiærum church in one with the westernmost of those mills leads across the edge of the shallow, in 10 feet water. *Lighthouse Channel.*

If coming through from the northward, stand in on the mark of Aarö Sound lighthouse in one with the north-west point of Aarö, and Kiærum church between the two mills at Assens; but a third nearer the east mill.* When exactly on this latter mark, steer S.E. ⅛ E. into the narrow channel, under easy sail, until Baagö lighthouse comes in one with Brandsö, midway between the wood and the west point of the island, which mark is then to be followed by hauling round to the southward, through the narrows;† and continue on this mark till the western side of Vedelsborg Wood is drawing open of the western end of the village on Baagö.‡ Proceed on this new mark until Huusby church is open to the eastward of Baagö, when the western edge of the wood is to be run a little more to the eastward on Baagö village, and keep on this mark till you reach the principal leading-mark for the channel; viz., Sandager church, a little inside the east end of Billes Wood, bearing N.E. by E. ½ E. *North Entrance.*

When coming from the southward, and on this leading mark *South Entrance.*

* View 38. † View 39.

‡ View D. on the Chart, Sheet III.

it is requisite, as soon as the eastern edge of the wood on Brandsö is in one with the S.W. point of Baagö, to take that mark, steering about N. by W. ½ W., and minding not to come more to the eastward than to bring the wood in one with the lighthouse, nor more to the westward than to draw the western side of Vedelsborg Wood in one with the middle of Baagö village; which two marks indicate the edges of the banks in 4 fathoms. When Huusby church is in one with the south-east point of Baagö, steer N. ¾ E. until the western side of Brandsö Wood just passes Baagö lighthouse, then steer N. ½ W.; and when Kiærum church comes between the mills, to the southward of Assens, a third nearer to the eastern one, steer on that mark, about N.W. ¾ W., through the channel.* Small vessels, not drawing more than 10 feet, may enter or quit this channel by crossing Baagö Flat, with Kiærum church between the Assens mills; and this mark may even serve for working through the channel by minding, while in its western end, not to run the church fully on with either of them. When the wood of Brandsö is open of Baagö lighthouse you are clear of the shallow of Græsholm, and may stand farther to the southward; or more to the eastward when the eastern edge of Vedelsborg Wood is open to the westward of Baagö, being then past the shallowest part of Baagö Flat; and may also stand farther to the northward.

Aarö Island and Shallows.

672. The island of Aarö is surrounded by extensive flats, and shoals, except on its western side, where the shallow is very narrow, and forms, in conjunction with the equally bold shore of Slesvig, the clear channel of Aarö Sound, with depth for ships of any size; and being the most direct and shortest passage through the Belt. To the eastward of Aarö lie the small islands of Aarö Kalv, the two Smaaholms, Bastholm, and Græsholm, a patch of sand, dry at low water. It has been already mentioned that the shallow on the N.E. side of these holms is very steep towards the Lighthouse Channel, though less so towards the S.E., where it borders upon the Main Deep.

Aarö Kalv Beacon.

On the long eastern spit of sand extending from the Aarö Kalv, there is a floating beacon, with a red pole and ball, in 2 fathoms, the marks for which are, Baagö lighthouse, bearing N. ½ W., and the south point of Linderum in one with the north point of the northern Smaaholm. To the northward of Aarö the shallow extends nearly 1¾ miles, and ends in the Barden Ground, which

* View 38.

is pretty steep on its off-side. To the southward the Aarö shallow gradually slopes down to 4 fathoms at the distance of a mile from the south point of the island. The objects on this low island which serve for marks are, the village, the Vold (the only hillock on it), and some single trees and bushes.

Pilots are stationed there. *Pilots.*

673. The island of Linderum is uninhabited; and united to the shore of Slesvig by a flat, and surrounded by a shallow, which, within the depth of 2 fathoms, extends half a mile in every direction. Barlöse church in one with Baagö lighthouse leads to the southward of the flat. *Linderum Island.*

674. In Aarö Sound, on the Slesvig shore, there is an artificial harbour, with 9 to 10 feet water, for the vessels which carry the mail; but its entrance is only 37 feet wide, and besides, it has the inconvenience that when coming from the southward, and therefore steering N.W. by N. for the harbour's mouth, it is necessary to round the southern pier-head, by turning abruptly to the S.W. by W. Small vessels are at liberty to enter this harbour, and fires and candles are allowed. A buoy is placed in 7 fathoms water, S.E., half a cable's length from the pier-head. *Aarö Sound Harbour.*

675. The northern spit of Aarö shallow is the Barden Ground, with 6 feet water on its shoalest part; it is rounded to the northward by keeping Kiærum church well open N. of the southern mill of Assens; and it may be cleared to the southward by keeping Huusby church a little inside of the north end of Baagö. At the N.W. end of the shoal there is a floating beacon, in somewhat more than 3 fathoms water, with a white pole carrying a broom; and on the following marks: Araö Sound, just shut in, and Sönderby Cliff in one with the low north-east point of Bastholm. The mail vessels stand across the flat, between it and Bastholm, in 8 to 10 feet water, in order to enter the Lighthouse Channel; and the mark they use is, Aarö Sound lighthouse open N. of Aarö. In working, you may stand towards Bastholm until Barlöse church opens to the northward of Baagö lighthouse; and towards the Barden Ground until the eastern edge of Vedelsborg Wood is in one with the south point of Ægholm. In a N.W. gale both mail and ferry vessels pass to the southward of Aarö; and, in that case, during the night a lamp is lighted in a house upon the beach, at the south end of Aarö. *Barden Ground.* *Beacon.*

676. The principal entrance to Aarö Sound is to the westward *Aarö Sound.*

of the Barden Ground, between it and the Linderum shallow, in a depth of 5 to 6 fathoms, but steep-to on both sides.

About a mile to the northward of the Barden Ground there are some ledges of rock, but vessels may pass between them, by keeping the north point of Aarö Kalv to the southward of the Smaaholms, about their own breadth. To pass to the eastward of those ledges, Raad Head is to be kept in one with the north-west point of Aarö, until a small conspicuous bush on Aarö, east of the Vold, comes in one with the eastern house of Aarö village. This mark leads also between Barden Ground and Linderum shoals, and may serve, until Assens church is in one with the south end of Bastholm, Aarö Sound shutting in simultaneously. Continue on this mark (Aarö Sound, just shut in) until Baagö lighthouse is the breadth of Bastholm to the northward of it, then edge away

Leading Mark for Aarö Sound. westerly on this new mark, in order to pass to the northward of a flat, with 3 to 3½ fathoms, and proceed until you reach the principal leading mark for the sound, viz., the west points of Brandsö and Linderum in one, which will lead through it to the southward.

Coming from the southward, let the converse of the above directions be observed; but the west point of Brandsö being very low and far off, you may use, as a leading mark from the southward into the sound, the conspicuous western edge of Brandsö Wood in one with the eastern side of Linderum, and this mark, farther up the sound, will join the other leading-mark, viz., the western points of the islands in one, which is then to be followed. The western edge of Brandsö Wood in one with the west point of Aarö may also lead into the sound; but along the eastern side of the channel. It is stated in Art. 658 that vessels not drawing more than

Linderum Flat 12 to 13 feet may stand across Linderum Flat, to the westward of that island, and so proceed through Aarö Sound; and the mark for so doing is, to keep Aarö Vold in one with a small bush, standing to the north-east of the village. On this mark the least water is 14 feet, and you may work through without getting into a less depth by running the Aarö Vold, on the one tack, in one with the north end of a copse; and on the other tack in one with a single tree standing to the southward of the copse.

Bastholm. Smaaholms. 677. Bastholm and the Smaaholms are joined by a flat, dry at low water; but between Aarö and the Smaaholms, as between Bastholm and Græsholm, there are narrow passages for small craft, with one fathom water.

678. The shallow off the south end of Aarö extends fully a mile to the southward, as before mentioned; and you may pass to the eastward of this shallow by keeping Sandager church in one with Billes Wood, a little inside of its eastern end;* or else with the church, bearing N.E. by E. ½ E. Small vessels may stand across the flat, in 10 feet water, by keeping Assens church in one with Brahesborg. When a small wood, called the Begklöven on Aarö, is run to the eastward of Aarö village, you may enter the sound from the eastward.

The shallow of Syvsighage, on the Slesvig shore, is avoided by keeping two round woody hummocks on Halk Head visible outside of Raad Head. *Syvsighage Shallow.*

679. For vessels not drawing more than 10 feet the best anchorage in Aarö Sound is abreast of the village on Aarö, in 2 fathoms, with the sound shut in to the southward, where they are out of the track of the current, and in excellent holding-ground. *Aarö Sound Anchorage.*

680. Off Raad Head a reef extends to the southward half a mile; and more than 3 cables' lengths from the beach there is a rocky patch, with 5 feet water, and steep from 3 fathoms; the mark for which being Raad Head in one with the north-west point of Aarö. It is necessary to keep the sound well open to clear it. For large ships the marks have been already specified; but such as draw less than 12 feet may keep so far to the westward that the eastern side of Brandsö Wood closes in behind Syvsighage, on which line the depth is 15 feet over the shallow off Raad Head. *Raad Head.*

Between Raad Head and Halk Head the shallow following the coast forms a bay, and off the latter it is only 3 to 4 cables' lengths wide, abruptly sloping into 4 fathoms, with rocks near the beach. It may be passed, without getting less than 14 feet, when Raad Head is in one with the north-west point of Aarö. *Halk Head.*

681. The shallow continues along the shore, without any change, to Revshale, off the south point of which there is a neck of sand, with very shoal water for more than 3 cables' lengths; on its southern and western sides it is very steep up from 10 fathoms, so that the edge of the sand may be distinguished by the tint of the water. Inside of a line joining Revshale and Barsö the bottom is all soft, with a depth of 12 fathoms, shoaling towards the shore. *Revshale Point.*

In the bay of Sandvig there is good anchorage in from 6 to 7 *Sandvig Bay.*

* View C. on the Chart, Sheet III.

fathoms, sleek, and sheltered against all winds, except those from south to west, which produce a rough sea.

Abreast of Vilstrup West Wood large ships ought not to approach the shore within a depth of 6 fathoms, as outside the shallow there is a detached sandy flat with 21 feet water, and for which the high, woody shore offers no marks. Rocks likewise are scattered on the shallow, which, all along the bay, is only 2 to 4 cables' lengths wide, and steep-to from 4 fathoms. At Slipsminde, in the inner part of the bay, a lake discharges its water into the sea: it affords no passage, not even for boats.

682. In the wide expanse, between the islands of Aarö and Als, there are four patches, viz., the Thorö Bank, with 18 feet; and farther westward, the Schönheider Flat, with 23 feet; the Holst Flat, with 4 fathoms; and the Lille Ground, which has been already mentioned in Article 661.

Thorö Bank. The east side of Thorö Bank lies a mile S.W. of Sönderby cliff, on the coast of Fyen: it is about three-quarters of a mile in length, north and south, and two-thirds of a mile wide; it consists of sand and seaweed; and the mid-channel line, between it and Sönderby cliff, is Baagö lighthouse, open S.W. of Thorö in from 5 to 8 fathoms, sand, Assens church will then be seen open to the eastward of the houses in Thorö.* To pass to the westward of the bank, in scarcely 4 fathoms, keep Assens church in one with the westernmost of the three highest houses on Thorö. The church quite open W. of the houses will ensure 5 fathoms.

Schönheider Flat. Halk Head in one with a copse inside of Raad Head, and Loit church a little to the northward of the middle of Barsö, are the

Holst Flat. marks for Schönheider 4-fathoms Flat. On Holst Flat, of the same depth, Nordborg and Oxbüi churches will be seen in one, and Raad Head, just open E. of Halk Head; but these flats are of consequence to ships of the line only.

Fyen Shallows. 683. Off Sönderby Cliff the shallow is foul and steep-to, but narrow, and continues so round the bay at Flenstofte, as far as Agernæs, from whence to Langensbo Point it enlarges to two-thirds of a mile.

Barsö. 684. The small island of Barsö off the Slesvig shore is of moderate height; the shallows on the N.W. and S. sides are a cable's length wide, and steep, from 8 fathoms; but to the eastward they extend half a mile, and slope gradually into 4 fathoms water.

* View 40.

In a small bay on the west side of the island there is a wooden pier for boats, with 3 feet water at the pier-head, and off which, 1 to 2 cables' lengths, small craft may anchor in 15 feet, but on indifferent holding-ground. The island lies in the mouth of Gienner Fiord, with good passages 10 to 13 fathoms deep on both sides, and it so shelters the bay as to make it a remarkably excellent harbour. *Gienner Fiord.*

685. Off the north point of Gienner Fiord, Sönderballe Head, a sandy spit, projects E.S.E. a third of a mile into 4 fathoms water; but it is steep-to, and near the beach it is rocky. From thence, all round the bay, the shallow is narrow and steep-to, except at its inner end, where the small island of Kalvö stands on the shallow. The narrow gut that separates Kalvö from the main carries only 2 or 3 feet water, and to the eastward of that small island there is a detached sandbank, with 16 feet water. Dyvek Bay is a small recess on the southern side of the fiord, and off its outer point a sandreef, nearly dry, stretches E.S.E. two-thirds of a cable's length: it is steep-to from 5 fathoms, and is separated by a very narrow passage from a 23-feet patch of sand, $1\frac{1}{3}$ cables' lengths from N.E. to S.W. The mark for the north side of this patch is the hill of Knivsbierg, just visible to the southward of the high land in front of it. To the S.E., distant half a mile from the above sandreef and 2 cables' lengths off shore, there is another small flat, carrying likewise 23 feet water, and the mark for the middle of which is Knivsbierg in one with the point of the sandreef. Farther out, off Brödet, the S.E. point of the fiord, the shallow widens to 3 cables' lengths, and is steep-to; but a forked sandbank, jutting out N.N.E. and N.W. by N. to the distance of a mile from Knuds Head, forms an indenture between it and the shore, with 4 and 5 fathoms water. About two-thirds of a mile from the head, on this sandbank, there is a patch of rocks with from 6 to 9 feet water, and the whole bank is very steep. *Kalvö.* *Dyvek Bay.* *Brödet Point.*

686. To stand into the fiord through the northern channel, keep the low sandy point of Vorskov just open to the southward of Sönderballe Head, and steer W. $\frac{1}{3}$ S. in a depth of 11 fathoms, past the north end of Barsö, until Loddenhöi, the highest part of the island, bears S.E.; then steer S.W. $\frac{3}{4}$ W. midchannel, and when farther in, N.W. by W. $\frac{1}{2}$ W., so as to round Sönderballe Head in 9 fathoms. A line-of-battle ship must keep to the northward of the inner 23-feet patch of sand, by just seeing *North Channel into Gienner Fiord.*

Knivsbierg to the southward of the high land in front. When this flat is passed she may come to an anchor in 9 fathoms, clay, on the mark of Loddenhöi, a little shut in on Sönderballe Head. With a S.E. wind a better berth may be taken in Dyvek Bay, by steering S W. inside of the flat, and bringing up on the mark, Knivsbierg visible between the innermost mill in the fiord and the first projecting point to the eastward of the mill, which point may be known by its steep cliff with bushes on the declivity.

South Channel. When entering the fiord by the southern channel, with a leading wind, keep Knivsbierg well open to the northward of Vorskov Point, and steer about N.W., so as to pass to the northward of the outer sandy patch; then follow the directions given above. Working through this channel, you may round the shallow off Barsö by keeping Knivsbierg in one with Lege Point, the low S.W. angle of the island; and on the other side the Knuds Head shoal and the shallow off Brödel, are not to be approached so near as to allow Knivsbierg to come in one with the woody point of Vorskov, as close inside of this mark the shallow abruptly rises.

Kalvö Harbour. 687. In the inner end of the fiord there is a harbour which small vessels may take by steering W.N.W. ½ W., or nothing to the southward of the line joining Loddenhöi and the south point of Sönderballe Head, so as to avoid the shallow reef N.E. by E. off Kalvö. When it is passed, steer W.S.W. towards some piles standing two-thirds of a cable's length from the beach, and make fast to them in 15 to 6 feet water.

Knuds Head. 688. From Knuds Head, the large promontory between the Gienner and Apenrade fiords, there are two shoals; one has been already mentioned (Art. 685), and the other, called the Elsholm Flat, extends 1¼ miles from the head to the limits of 4 fathoms. On its east and south sides it is so steep as not be approached by the lead, and you pass outside of both these shoals on the marks before mentioned, Knivsbierg well open to the northward of the woody point of Vorskov. Small craft may stand across those banks, in 8 or 9 feet water, by keeping Knivsbierg in one with some trees to the northward of the farm of Brödet.

Elsholm Flat.

Apenrade Fiord. 689. Apenrade Fiord, at its mouth, between Knuds and Varnitz Heads, is 1¼ miles wide, and trends to the westward 5 miles. From Knuds Head to the next low point on the north side of the fiord, the shallow along the shore consists of clean sand from 1 to 2 cables' lengths in breadth, and then suddenly slopes down

to 5 fathoms; but off that low point the Skiær Reef projects to a quarter of a mile: it consists of sand and weeds covered with only 3 feet water, and so steep as to drop into 8 and 12 fathoms. From thence to the first tile-kiln the coast recedes a little, and the shallow becomes somewhat less steep as far as Aabek, where the bottom is soft, and where abundance of mussels are dredged, poles being placed there for that purpose. Off the tile-kiln the shallow is half a mile wide, as well as along the inner part of the fiord. From this shallow a spit of sand and sea-weed, with 16 feet water, projects to the distance of 1⅝ cables' lengths from the beach; and inside of it there is a bay, with a soft bottom and a depth of 7 to 5 fathoms, gradually shoaling towards Apenrade Harbour, where wooden piers are placed in different directions, and several mooring-posts on both sides of the inlet to it which trends N.N.W. between four piles. The piers have been recently heightened, and the harbour as well as the entrance to it dredged out to a depth of 12½ feet water. On the southern pier-head stands a harbour-light of a red colour; it is placed 16 feet above high water, and is lighted until 1 A.M. from 15th September to the 1st April. In the S.W. corner of the fiord, abreast of Styrtom, there is a small spit of sand, the Trabeens Hage, 3 cables in length, and very steep, from 3 fathoms to 3 feet. To the eastward of this, off Hostrup, another small spit extends 2 cables' lengths from the beach, and perfectly steep from 7 fathoms to 6 feet. The shore is woody, and along the beach there are rocks as far as Felsbek water-mill; but from thence to Varnitz Head, 7 to 8 fathoms water will be found within half a cable's length of the land. Some rocks lie round the point at the distance of a cable's length, but close to them are 10 fathoms water. With the old castle of Brönlund in one with the south end of Iörgens Wood, Varnitz Head may be passed in 15 fathoms; but then it is necessary to bring the castle outside the pier-head at the tile-kiln, in order to pass to the southward of the Skiær Reef, the extreme point of which is marked by the castle being in one with the middle of the pier, and a house, covered with tiles and standing on the low point, being in one with the straw-thatched house next to it. Abreast of the reef, in the Kule (or Hole), there is a depth of 20 fathoms. To clear the Trabeens Hage, a remarkable hollow in the wood at Grube Mill is to be brought in one with the tile-kiln, which stands to the northward

Skiær Reef.

Apenrade Harbour.

Light.

Trabeens Haye Spit.

Hostrup Spit.

Varnitz Head.

Trabeens Hage.

of the watchhouse. To pass to the southward of the 16-feet spit, in the inner part of the fiord, Brönlund Castle is to be kept just opening to the northward of a windmill of Dutch construction. When on this mark, as soon as the N.W. point of Iörgens Wood just shuts in upon the point of the wood next to it, you may keep N. and N. ¼ E., and bring up in the road, inside the flat, in 5 to 7 fathoms water, soft bottom, and sheltered against all winds. Vessels, not too deep in the water to enter the harbour, may steer N.N.W. for the piles which mark the inlet.

To the westward of the Skiær small vessels may anchor on the sandy flat in 12 to 15 feet water, with the castle open of the south point of the wood, near the tile-kiln, and sheltered on all points.

Aabek Bay. 690. In the bay of Aabek, and farther in the fiord, between the watchhouse and the mill, even small vessels ought not to stand within 13 feet, as the mussel-poles stand in 12 feet, and are cut off at the water's edge.

Apenrade Slips. 691. Ship-building is carried on at Apenrade on a large scale. There are five slips, four of which are in the harbour, and the fifth to the northward of the mill, in a well-furnished establishment, with a basin and a canal to it carrying 8 or 9 feet water. The town possesses many vessels employed abroad, but *Supplies.* the home trade is not considerable. Vessels may be provided with everything, and may even be hauled up on the slips; but fire and candles are not allowed in the harbour. The dues *Port Charges.* paid by vessels belonging to the town are 16 rbsk.; privileged foreigners pay 24 and unprivileged ones 32 rbsk. per com. last. Vessels that are hove down pay 3 rbsk. per com. last, if belonging to the place, and all others 6 rbsk; and finally a charge of 40 rbsk. per com. last is to be made on every vessel built there.

Varnitz Head. 692. Varnitz Head separates Apenrade and Als Fiords; and *Als Fiord.* this last, which separates the island of Als from the main, is divided into two branches, Augustenborg Fiord and Als Sound. The depth decreases gradually, from 18 to 5 fathoms, towards both shores, which are both in most places clean. In the mouth, *Stegvig* however, of Stegvig Bay there are a couple of flat patches, with 3½ and 4½ fathoms; and yet that creek and Sandvig also *Snogbek Spit.* carry 4 fathoms up to their innermost ends. From Snogbek Point there is a pretty steep sloping spit, at the end of which stands a beacon, on the mark of Varnitz Head in one with Harde-

shöi Point, where there is a ferry. Thus, while the mouth of the fiord is shut, you are clear of the spit, and when Düppel windmill* opens outside of the wood at Reventlaw, you are to the eastward of it.

Augustenborg Fiord.

In making Augustenborg Fiord, care must be taken to avoid a shallow spit on the north side, which extends off Stohlbronæs more than 4 cables' lengths in a W.N.W. direction, with only 10 feet water at the distance of a third of a mile from the point; and which may be cleared to the southward by keeping Hogebierg mill well open of the point. There is also on the south side a sand-spit projecting rather more than 2 cables' lengths from Arnkiel Ore, to pass close to the northward of which, keep Ballegard mill just open of Snogbek Point. On the mark, Varnitz Head in one with the ferryhouse at Hardeshöi, you may steer S.E. and enter the fiord in 5 to 6 fathoms water, soft muddy bottom, until Ulkebül church is in one with the eastern edge of a grove to the northward of the church; on which mark you may stand farther in until abreast of Hesler Point.

693. From both sides of the fiord the shallow from the shore slopes gradually except at the spit, Halvmaanen (Crescent) off Arnkiel on which there is a beacon pole, and may be cleared by keeping Snogbek Point just visible outside of Arnkiel Ore. Vessels drawing 8 to 9 feet may proceed to the pier at Augustenborg by steering to the S.E. and being careful, before Igen church is hidden by Hesler Point, to keep Hörup church outside of Augustenborg park until Hörup mill is visible midway between Hörup church and the edge of the wood on the inner end of the fiord, when on this latter mark they may proceed farther in between Röuuen, a rocky patch on the north side marked by two stakes, and Meylen, a shoal with a soft bottom on the south side, on which are three stakes. Between these shoals the depth decreases gradually from 14 to 10 feet, mud. From hence steer more easterly towards the pier, but, in order to clear a rocky spit off the point from the wood on the north side, marked by two stakes, keep Ballegard mill just open of the point of Skorskoven (the large wood). There are wooden piers in Dyvig and Stevning Nor.

* See Entrance to the Baltic, Kiel Bay, Sheet IV. It is said, Düppel mill has been demolished, but that a house with a thatched roof has been erected on its site.

Als Sound. 694. Bound for Als Sound, and steering on the above-mentioned mark, Düppel mill* open E. of Reventlaw Wood, when round Snogbek Point, you must haul in to the westward, in order to clear the western prong of the shallow off Arnkiel Point, keeping Hagebierg and Brandsbüll mills in one. You may then keep midchannel through the sound, the general depth of which is from 5 to 8 fathoms; but there are some patches dangerous to large ships, and yet we have no marks to offer for them. The most dangerous one has but 3 feet water: it lies a little to the northward of Rönhof, and is separated from the shallow along the Als shore by a channel 3 fathoms deep, though only a quarter of a cable's length wide. The patch itself is only 40 feet across, and Rönhof bears S.S.E. ½ E. from its north end, and S.E. by E. ½ E. from its south end; both of which are but indifferently marked by mere sticks without brooms.

* *Sönderborg Harbour.* 695. Sönderborg and its harbour lie at the southern end of Als Sound, and just inside of the castle, where there are 10 fathoms depth, with good holding-ground. The sound is there so narrow that ships of the line find it difficult to anchor; but the shore is steep-to, and vessels drawing 18 feet may run alongside the pier. The southern entrance to Als Sound is rather winding, between two sandy points projecting from the opposite shores; the Als side being flat, with good holding-ground and fit for anchorage. Two floating beacons have recently been placed at this entrance: viz.—a white pole with two brooms in 18 feet on the east side at Als Flat; and on the west side at the Sundevit Spit a red pole with one broom in 12 feet. This flat is cleared by keeping Düppel windmill* to the southward of a remarkable whitish cliff near the beach, and it may be passed to the westward by bringing a conspicuous tree in one with the eastern mill of Sönderborg. But if the object be to anchor on the flat, in 3 fathoms and good ground, Düppel mill* may be run on with a cleft or hollow in the above cliff and a high house on Als brought in one with the west side of the castle.

Sundevit Spit. 696. Sundevit Spit, on the Slesvig side, is shallow and steep; and the deep-water channel leads from thence close round the outer walls of the castle, which rises from the southern side of the harbour. To clear the spit, keep a high house on Als in one

* See note to Art. 692.

with the west side of the castle. At the town, vessels run alongside the wharfs or moor between piles, which stand abreast of the north end of the town, at a place appointed for the discharge of ballast. Pilots are stationed there, and the use of fire and candles is permitted. *Pilots.*

697. Kosten, in the sound, is commonly resorted to as an anchorage or stopping-place, on a pretty extensive flat, with 2 to 2¼ fathoms, distant 1¾ miles to the southward of Snogbęk Point; and likewise in the fiord a mile to the north of Ballegaard, close at the north end of the wood, in 3 fathoms water. *Kosten.*

698. In the Little Belt, between the islands of Als and Fyen, there is a range of insulated shoals, of which two are dangerous to vessels of all sizes.* They stand in the following order:—A second Lille Ground, with 12 feet; the Lang Ground, with 20 to 21 feet; the Hestesko, or the Als Rock, with only 1 or 2 feet; and the Steenrön, with 2 feet water. On the eastern edges of three of these shoals there are floating beacons; that on the Lille Ground having a red pole and one broom, on the Hestesko a striped pole with a red ball, and on the Steenrön a red pole with two brooms. You are to the northward of all of them when Horne church, in Fyen, is in one with the south point of Helnæs; and to the southward of them when Horne church is half way between the single house on Horne Ness and the south point of that peninsula. Another mark which leads well to the southward of the Steenrön is the highest part of Avernakö, open to the southward of Lyö. This shoal consists of a small round patch of white pebbles sparkling through the water, with a narrow tail of sand and rocks. The length of that shoal-spot is about a cable, and the flat is chiefly speckled sand with a few rocks. The point Komelvig on Als Island, open outside of Mummark Point, leads to the eastward of all; but as these two objects can only be distinguished by persons who are acquainted with the land, the stranger had better consult the chart, where he will find the different marks by which these dangers can be most easily and safely avoided.† *Detached Shoals.* *Lille Ground.* *Hestesko.* *Steenrön.*

699. The shallow off the north end of Als Island is called Trane Sand: it is remarkably steep, rising from 7½ to 1½ fathoms, and should not be approached nearer than 11 fathoms; the sand is *Trane Sand.*

* See Entrance to the Baltic, Great and Little Belt, Sheet III.

† See Kiel Bay, Sheet IV.

light-coloured, and in clear weather the bank may be perceived far off by the tint of the water.

Taksen Sand. 700. Along the eastern side of Als the soundings are gradual as far as Taksen Sand, which is steep-to, and may likewise be discerned at some distance by the hue of the water.

West Channel. The space between this coast of Als, and the range of insulated shoals, above mentioned, is called the Western Channel, the leading mark for which is a single tree, standing near the beach, immediately to the southward of Taksen Sand, kept outside of the wood to the northward of it.* This mark, where crossed by Hostrup church (on the Fyen side) in one with Helnæs Head, leads over a flat with from 5 to 6 fathoms, which, if wishing to anchor, is the best place on the coast for that purpose.

East Channel. To the eastward of the above range of shoals lies the widest and safest passage, and with a free wind it should be taken near the Fyen shore, till Horne church is nearly in one with Helnæs Head; when, as already mentioned, Lyö church (or the highest, and, from this side, the only visible trees in the village, partly hide the church) opens outside of Horne Ness, in order to avoid the shallow that extends to the south-westward off Helnæs Head. When working between Helnæs and Horne Ness come no nearer to the shore than to run the west point of Lyö just behind Horne Ness, which mark will avoid that shallow.

Helnæs Bay. 701. In Helnæs Bugt (or Bight) vessels of any size may find safe anchorage by coasting along the promontory of Horne Ness, at the distance of about a third of a mile. There is, however, in the entrance a flat, called the Middel Ground, with only 16 feet water, which reduces the channel between it and Kalvöre to the breadth of 1½ cables' lengths, and which requires great attention to clear; but when inside of the flat, vessels may haul towards the island of Ilumö, where they will find plenty of room in a depth of 5 to 6 fathoms.

Böigden Ferry. 702. A little to the eastward of Kalvöre lies the ferry-place of Böigden, off which there is excellent anchorage in 3 fathoms, sheltered by a shallow sand-bank, that extends 6 cables' lengths from the house on Kalvöre. A very narrow channel, but with more than 4 fathoms water, runs along the south side of Ilumö, with steep shallows on both sides, and might serve even for a

* View F. on the Chart, Sheet III.

winter harbour. Ilumö, Horse-Cay, and Viö, are all connected with Helnæs by a 12-feet flat, and with the Fyen shore near Falsled, by a flat with 11 feet. To the northward of this chain of flats and islands the bight has considerable extent and depth; but the sea is rather rough there with S.W. winds, and it is doubtful whether the anchors of small vessels would take sufficient hold in the ground, which consists of mud and mussels, with hard clay underneath. The only safe harbours are those of Brunehuus and Falsled, both of which are considerable shipping places, especially the latter, where also some ship-building is carried on. Though the obvious way to Falsled is to the southward of the islands, through the deep-water channel, yet that passage is seldom used, for all such vessels as trade there may cross over the flats. The mark to pass in 2 fathoms between the two spits of sand, which extend 2 cables' lengths from Ilumö and nearly 3 from Helnæs, is, to keep the conspicuous church of Jordlöse in one with a gap between two of the Damsbo woods. If going farther up the Bight to Brunehuus, follow the same mark until Horne church nearly closes to the west side of the houses on Ilumö, and then steer on this mark along the shore of Helnæs, until Dreslette church is in one with an opening between two copses, close to the beach and a little to the westward of Tiörne Head; on this line you may run in between Tiörne Head and Avernæs, where the depth is between 3 and 4 fathoms. Past Avernæs, keep mid-channel, in a depth of 3 to 2 fathoms, until abreast of Brunehuus, and then bring up in 2 fathoms in that excellent and perfectly land-locked harbour. *Brunehuus Harbour.*

703. The shallows all round the Bight are steep, but along the shore of Helnæs not very wide; they carry 2 to 6 feet water over sand and seaweed, and close outside of this depth they drop into 4 fathoms. Off Tiörne Head there is a reef with from 2 to 6 feet water on its south side, falling at once into 23 feet; the mark, therefore, of Horne church just open to the W. of Ilumö houses must be exactly preserved. From off Lögismose a shallow, carrying only one foot of water cuts off all access to the N.E. end of the Bight, and is so steep that no vessels ought to stand into less than 3 fathoms. To the westward of the house on Ilumö the shallow is inconsiderable, but to the eastward the flat may be approached by the lead. If bound to Falsled, and having passed Ilumö with the in- *Falsled.*

tention to enter by running along the islands, keep Hostrup church (the next to the east of Jordlöse) to the westward of a hedge on Biergehammer cliff, a point close to the westward of the village of Falsled, until a pointed hillock, Brunehöi, becomes visible between the wood nearest to the east of Falsled and a hedge yet more to the eastward; on this mark steer between Biergehammer Cliff and Viö, where the least depth is 11 feet. Past the neck of sand extending off Viö, which is nearly dry at low water, the depth increases to 3 fathoms, and in this depth is very good anchorage off Falsled, the bottom clay covered by sleek. When leaving Falsled, by the narrow deep-water channel, to the southward of the islands, keep Flemlöse church in one with Biergehammer cliff until the south point of Helnæs comes open to the southward of Ilumö; then adopt that mark till past the east end of Ilumö, where 4 fathoms will be found scarcely a cable's length from the beach.

704. The south end of the Little Belt, between the islands of Als, Ærö, and Lyö is perfectly safe, the only dangers to be avoided being the Lyö Flat and Poel Spit, the proper marks for which are given in the chart.* Lyö Flat affords a convenient stopping-place for small vessels, as it shoals gradually, but on the spit of Poel there is a patch with 12 feet water only, though a channel lies inside of it with a depth of 3 fathoms.

Lyö Flat.

Poel Spit.

Fyen South Shore.

705. Along the south side of the island of Fyen, between it and Ærö, there is a range of small islands, Lyö, Avernakö, Dreiö, and Skaarö, besides several islets and holms, amongst which many practicable channels exist.

Lyö Krog.

706. The passage between Fyen and Lyö is called the Lyö Krog, and is perfectly open and safe to the westward; and the shore of Fyen, between Horne Ness and the Knoll (a high peninsula), may be boldly approached. From the north point of Lyö, a sandy spit projects S.E. 2 cables' lengths, and, being quite steep-to, must be carefully avoided in entering Lyö Bay. This bay, on the north-east side of the island, possesses good soft clay holding-ground. Half-way along the bight, 2-fathoms water may be found close to the shore; but at the 4-fathoms line the shallow is so steep, that large ships ought not to stand in to less than 10 fathoms. The best anchorage is in 3 fathoms,

Lyö Bay.

* See Entrance to the Baltic, Sheets III and IV.

before the bank suddenly breaks down farther out. This bay affords but indifferent shelter with easterly winds, in which case vessels may round the north end of the island and come to on its western flat. A rock with only 3 feet water lies in Lyö Harbour, in 11 to 12 feet water, and is pointed out by a stick.

707. From the east point of the island, Lyö Sand stretches out three-quarters of a mile, reducing the passage to half of its natural breadth, and being at its extreme point perfectly steep from 9 fathoms to 2 feet: its N.E. extremity is marked by a straw beacon. The opposite side of the passage is formed by a flat neck of sand, carrying 2½ fathoms, and connecting the Knoll with the steep-edged reef, called the Knas Ground, which dries at low water. The mark to lead through the channel between these shoals and Lyö Sand is Horne church, and the high land adjacent to it, Tostbierg, open to the westward of the Knoll; another mark, is a green mill standing close to the westward of the town of Faaborg kept well open of the Dyrborg points. And then the high N.E. point of the island of Korshavn in one with the low N.E. point of the island of Avernakö, will equally clear the S.W. point of the Knas Ground, and both the points of Lyö Sand. The edge of that steep shallow is so distinguishable by the tint of the water as to be a good guide in working through; the Knas Ground requires far more attention, but, there have been placed recently, on its south side, two poles carrying brooms, and on its north side a straw beacon. The above-mentioned mark is to be followed until the mill of Bregninge (on Taasing Island) is in one with the northern part of the high-land of Svelmö, which will lead to the southward of the Knas Ground; and then, by bringing the church of Bregninge in one with the north end of Svelmö houses, you will pass to the northward of Avernakö Trille, a long reef extending off the north end of Avernakö, and marked by a straw beacon. During less clear weather, a nearer mark will serve for clearing the Knas Ground, viz., Aastrup church in one with the southern cliff of Biörnö, or Bregninge mill just open to the southward of Svelmö houses, which is the mark, also, for the beacon on Avernakö Trille. *Lyö Sand.* *Knas Ground.*

708. The island of Biörnö lies in front of Faaborg Fiord dividing its entrance into two channels, the western and eastern; the first of which will admit ships of any size, and the latter only those drawing less than 11 feet. Besides the above-mentioned *Faaborg.*

shoal, the Knas Ground, there are two others which help to block up the western entrance; one of them is called by that common name, the Lille Ground: it is quite insulated, and consists chiefly of rocks which dry at low water. The other, the Knoll Sand, is a large and very steep flat, extending 5 cables' lengths N.E. of the Knoll, and 3 cables' lengths S.E. to its south point, called the Knoll Spit. Between this south-eastern spit and the Knas Ground there is a deep and clear bay close to the shore of the Knoll; but off the end of the Knoll Sand a flat with 21 feet water extends towards the Lille Ground, so as to leave only a very narrow channel between them. For this reason large ships ought never to attempt any other channel than the Biörnö Deep, along the western face of the island, where they are sure of a depth of 5 to 8 fathoms. Smaller vessels may pass, according to circumstances, between the Lille Ground and the Knas Ground, or between the former and the Knoll Sand. To pass to the southward of the Knoll Sand, keep the mill, which stands to the eastward of Holstenhuus, in one with the lower part of a hedge leading towards the beach of Biörnö.

Lille Ground.

Knoll Sand.

Biörnö Deep.

709. To enter Biörnö Deep, between the island of Biörnö and the Lille Ground, a conspicuous-pointed hill, called Lykkehöi, situated on Horne Ness, in the field at Bierne, is to be kept halfway between a tall tree, standing at the south-westernmost house in the village of Dyrborg, and a house placed some distance farther inland, and somewhat more southerly. In working, it is necessary to tack off the Lille Ground when the hill is in one with the house, and off Biörnö when the hill is in one with the tree.

Knas Channel. 710. To pass between the Lille Ground and the Knas Ground, the same hill, Lykkehöi, is to be kept just open to the northward of a conspicuous bush standing alone on the north end of Beverasken, the first cliff to the south and west of Dyrborg in the direction of the Knoll; in working, tack off the Knas Ground when the Lykkehöi is run towards the northernmost bush on Beverasken, and off the Lille Ground when Horne church is visible a little to the southward of the first house to the southward of Dyrborg, the same house just mentioned as a mark for the Biörnö Deep.

Knoll Channel. 711. A third channel lies between the Knoll and the Knas Ground, but close to the latter, and so narrow that though there

is a sufficient depth for vessels of all sizes, it is not practicable, not only on account of its narrowness, but from a patch, with 31 feet water in its entrance. The best way, therefore, of crossing the long shallow which stretches from the Knoll to the Knas Ground, is by a swatch where the depth is 17 to 18 feet. The mark for it is, to keep Faaborg tower somewhat open of Sidser Point (the first projecting low point N.E. of Dyrborg), and to steer on this mark, about N.E. until Diernisse church is in one with the north-western cliff of Biörnö, when, in order to avoid Knoll Spit, it is necessary to edge away easterly, until Svanninge church opens E. of the wood on Sidser Point. Then steer towards the place where the three channels join each other, and follow the directions given above for the Biörnö Deep. Working in this way, Diernisse church may be run in one with two stone hedges, which will be seen on the west end of Biörnö, and which, being parallel to each other and directed towards the beach, just indicate the edges of the shoals on each side as the church comes in a line with one or the other. You may also stand towards the Knoll until Faaborg tower is just shut in upon the point of Sidser; and towards the Knas Ground until Faaborg mill comes just inside of Sidser Point. You may work on, by paying attention to these marks, until Diernisse church comes in one with the north end of the westernmost cliff of Biörnö, when, in order to avoid the Knoll Spit, you must tack; and again, when the church comes in one with Steen Point on Biörnö, to clear the Knas Ground. By following these directions you may continue to work in until Svanninge church becomes visible outside of the wood on Sidser Point, and the village on Biörnö is concealed by the land, when you may stand close to Biörnö until being in the tacking mark for the Biörnö Deep, viz., the Lykkehöi, in one with the tall tree at Dyrborg; you must then tack and stand towards Knoll Sand, until Svanninge church just begins to be in one with the wood. Having advanced so far as to be abreast of the low part of Biörnö, you must not stand nearer to that island than to bring Svanninge church just outside of Sidser Point, for off the north-west point of Biörnö, in 2 fathoms water, there is a large rock with only 4 feet water. Proceed then on the last mark till Diernisse church is in one with the easternmost of two farms situated nearly midway on the border of the first wood to the eastward of Faaborg, which is

Knoll Swatch.

Sunk Rock.

the leading mark for the channel or deep-water inlet into the fiord of Faaborg, but this inlet is so narrow that the church is to be exactly in one with the very house of the farm, and by no means outside of it. Both the inlets to Faaborg Fiord are pointed out by beacons, which, on the starboard side carry brooms, and those on the port side, bundles of straw.

Dyrborg Vig. 712. Coasters not choosing to stand into Faaborg Fiord, particularly during autumn or winter, often prefer anchoring in Dyrborg Vig, a perfectly clean bay, with 3½ to 4 fathoms water, between the Knoll Sand and Alsgaard Head, a small point between Dyrborg and Sidser Point. To work into this bay you may stand close to the Knoll Sand, plainly visible by the light tint of the water; and Algaard Head may be approached until the third house in the village of Dyrborg is in one with a cliff called the Slots-klint. At Dyrborg there lives a pilot, who attends when the signal is made, and takes vessels to the different places in the vicinity and through the whole of the Little Belt, and is entitled to beacon-money from every passing vessel not taking a pilot, at the following rates:—home vessels, half rbsk. and foreign vessels, 3 rbsk. per commerce last. If the intention be to run up the fiord to Faaborg, follow the above-mentioned directions—to keep Diernisse church in one with the farmhouse until Horne church becomes visible to the northward of Dyrborg Park, and then vessels drawing 11 feet, and favoured by a free wind, may steer directly for the harbour's mouth. Large vessels, and all with a contrary wind, must keep on the former mark—Diernisse church in one with the farmhouse till Horne church comes in one with two small bushes standing close to the beach on the north side of the bay of Bierne Krog, and until Lykkehöi is just open to the northward of Dyrborg Wood. This is to avoid the Höi shoal, with 8 feet water; when it is passed, steer about N.N.W., but minding constantly to keep Horne church to the northward of the two small bushes, and you may come-to in a depth of 3 to 3½ fathoms when Faaborg church and tower are in one, and Svanninge church visible to the westward of the town of Faaborg.

Pilot.

Höi Shoal. 713. The mark for the Höi Shoal is—Horne church to the northward of a bush standing in Bierne field, midway in the bay, and Lykkehöi visible between the Lunkes hills, which are the first two elevations of the ground to the north and west of

Dyrborg Wood. From this shoal, in the direction of Sidser Point, there is a rocky ridge, with a depth of 2 fathoms.

Farther in the bay, opposite to the town of Faaborg, distant half a mile from the tower, is a heap of stones, dry at low water; but, as it is out of the track to the harbour, it is of no great consequence. The best anchorage is 1 or 1½ cables' lengths from the south end of the harbour, with Brogade street in the town open. In the eastern part of the harbour the depth is 13 feet, but in the western part from 11 to 12 feet, and fire and candles are allowed on board. *Faaborg Bay.* *Harbour.*

Both of the entrances to Faaborg are now marked by beacons, of which those to be left on the starboard side are stakes carrying brooms, and those on the port side bundles of straw. The pilot in Dyrborg is charged to keep these beacons in order. *Beacons.*

714. The channel into Faaborg Fiord, to the eastward of Biörnö, is called the Gryde Löb, or Gryde Deep, and is formed by the Gryde Rocks on a shallow of Biörnö, and the Katterö Reef stretching out from Fyen. The Gryde Rocks are also connected with a sandy spit extending from the low cays off the east end of the island, having only 1 to 3 feet water, and steep-to. In making the Gryde Deep from the westward, particular attention is necessary not to approach this sandy spit before being on the mark for the channel, viz. the east end of Faaborg church in one with the north end of the outermost Hedeklint, which is the easternmost of two small cliffs close to the eastward of the town. On this mark you may enter between the Grydes and the Reef until near the Höi shoal, following the directions for the anchorage mentioned above, by keeping Horne church in one with the bushes. For working through the Gryde Deep no marks have been discovered; but the sand-flats on both sides are plainly to be seen, and marked on the north side by stakes with bushes, and on the south side by straw beacons: there is also a broom beacon on the S.E. edge of the shoal from Biörnö. Attend to the lead and to the beacons; and do not come into less than 11 or 12 feet, nor inside of the beacons. *Gryde Deep.* *Beacons.*

715. The small island of Svelmö is surrounded by shallows; those to the westward gradually shoal and may be approached by the land when bound to Faaborg or to Hense Bay, which reaches from the shallow of Svelmö Katterö Reef, and which bay is perfectly clear and affords good anchorage in 5 to 7 *Svelmö.* *Hense Bay.*

fathoms. From the S.W. end of Svelmö projects a low and dry
Svelmö Trille. ridge of white sand called Svelmö Trille (quick-sand), to a distance of a quarter of a mile, and perfectly steep-to. The mark to clear it and all the shoals on both sides, even the Skaaö Reef, is Bregninge church (on Taasinge) well open S. of Lehnskov Point.

Avernakö and Korshavn. 716. The south side of the channel is bounded by Avernakö and Korshavn islands, both of which are surrounded by a narrow shallow, except off the east end of Korshavn, where it is connected to the extensive range of shoals and flats belonging to Dreiö and Skaarö. On the north side of Korshavn there is very good anchorage in a convenient depth, according to the draught of the vessel, abreast of the village; but it is not so much fre-
Rev Krog. quented as the Rev Krog, a bay formed between Korshavn and the Fleskholm Flat. The anchorage off the north-east corner of the island is excellent, particularly with southerly and westerly winds, in 5 or 6 fathoms water, the ground being stiff bluish clay.

Laas Ground. 717. The Laas Ground, stretching more than a mile out from Svelmö, is a very dangerous reef, with from 3 to 7 feet water, and then dropping perpendicularly into 7 fathoms. This reef forms the western boundary of a bay, called Rödkilde Vig, which is the mouth of the river Aaby; the eastern side is formed
Rödlok Ground. by the Rödlok Ground, and extends more than a mile from the shore of Fyen, with less depth, but also with fewer rocky patches than the Laas Ground, though there are several of gravel. To the eastward of this bank the shallow along shore diminishes in breadth until abreast of the Salt-houses, and to the eastward of them there is deep water close inshore.

Fiellebro or Aaby Inlet. 718. Between the Laas Ground and the Rödlok Ground, Fiellebro Inlet opens, and may be entered by bringing Aaby church broadly open to the eastward of a wood which stands on the western side of Aaby river, and by keeping the church, while in this direction, in one with two solitary bushes which may be seen in a field to the southward of it. By proceeding on this mark you will get sight of a beacon, which is to be left close on the port hand, as it stands on the western side of the inlet in 2 fathoms, though close up to it you will bring the depth of 4 fathoms. The inlet is narrow and winding, but clearly pointed out by beacons, which to the westward carry brooms, and

on the opposite side, bundles of straw. These beacons much facilitate the entrance to Fiellebro Inlet, the depth in which is 11 to 12 feet, with a bottom of mud and clay; and large quantities of firewood are shipped from thence.

In very clear weather a much sharper mark for this inlet will be found in Söby mill on the island of Ærö, as, if kept somewhat inside of the east point of Korshavn, it will lead directly into the mouth of the inlet.

Pilots for this inlet live at the Strandhouses, on the eastern shore. *Pilots.*

719. The principal leading mark for this long channel up to Svendborg Sound, Bregninge church well open of Lehnskov Point,* will take a vessel far to the northward of Fleskholm Flat; but she may pass nearer to it by keeping the village on Korshavn visible outside of the north-east point of that island. Fleskholm Flat shoals gradually and may be approached by the lead, whereas the Skaarö Reef is steep-to; and although a straw beacon is placed on its N.E. spit, vessels ought rather to keep on the shore of Fyen, which here is quite bold. *Fleskholm Flat.*

Between Fleskholm and Skaarö the flats form a deep indenture between the islands of Skaarö and Dreiö, wherein there is excellent anchorage in 2 to 3 fathoms, and only exposed to any sea with northerly winds. At the entrance to this bay of Grydholm the depth is irregular, and nowhere exceeds 14 feet. *Grydholm Bay.*

720. Having thus described the main channel into Svendborg Sound from the westward, we will now particularize the various passages between the different islands.

In the wide sound between Lyö and Avernakö, the former island throws out an extensive flat with some foul ground; whereas the shallow extends but 3 cables' lengths from the west side of Avernakö, and, being all clay, it affords a good stopping-place. *Lyö Sound.*

721. In the southern mouth of Lyö Sound, Skrams Flats consist of three patches, of which the centre one is the shoalest; but its least depth is 16 feet, on bluish clay, and therefore affords good anchorage for small craft. Larger vessels may pass between it and the Avernakö shallow by keeping Horne church in one with the western side of the high hill on the Knoll. By following this *Skrams Flats.*

* View 41.

mark until Aastrup church comes in one with the south end of Biörnö, and then taking this last mark, you enter the main deep, where the leading mark for this part of it is Bregninge church in one with the north end of the houses on Svelmö, which clears Avernakö Trille, a dry neck of sand, and quite steep. On the eastern side of the Trille there is an anchorage, in stiff clay, abreast of a hedge and close to the shore; but this anchorage is not to be recommended on account of the steep sloping shallow on which vessels must bring up, and yet so very near the shore as to be in danger in case of a sudden change of wind.

Fleskholm Cay. 722. The little cay of Fleskholm is surrounded by many rocky patches on a large flat, the passage between which and the eastern end of Korshavn is further impeded by an insulated heap of shallow rocks, forming two different channels. The eastern channel carries throughout 13 feet, but is so narrow as to be practicable for those only who are intimate with the place; whereas

Korshavn Pass. the western channel, called Korshavn Pass, with a depth of 12 feet, may be taken by steering directly for the low cay which forms the S.E. point of Korshavn Island, and which is steep-to. In approaching it from the westward this is easily done; but when coming from the southward, keep Aaby church, in Fyen, well open to the westward of that cay before being close to the entrance; in order to clear the shoals of Nebbe Point, the western extremity of Dreiö.

Fleskholm, Dreiö, and Hiortö Flats. 723. Fleskholm, Grydholm, Skaarö, Dreiö, and Hiortö, are all connected by one great flat studded with reefs, between which there are many passages for boats; between Dreiö and Hiortö, however, vessels drawing 6 feet may find a way by steering towards the High Stones, at the west end of Hiortö, and, with

High Stones. the lead quickly going, passing so close to them as to bring Tranderup church on Ærö in one with the green part of Hiortö, which then becomes the leading mark until Bregninge church is in one with the third tile-roofed house on Taasing Island, counted from its north end. Pursue this new mark towards Taasing until you reach the depth of 2 or 3 fathoms in the Knude Deep, which at once leads between Taasing and Skaarö into Svendborg Sound. But the whole of the above passage requires a minute knowledge, on account of the numerous rocks which obstruct it; and for which it is not possible to give intelligible directions or marks.

Knude Deep. There is, however, another method of getting into the Knude

Deep, as from the mouth of the Morke Deep (*see* Article 735) you may stand across the flat between Hiortö and Birkholm, without having less than 9 feet water, and thus enter that long and narrow channel. The Knude Deep, though tortuous and difficult, has nowhere less than 3 fathoms; it bends round the western coast of Taasing; and, passing between it and the opposite small islands of Odden, Meilholm, Hielm, and Skaarö, joins the main deep at the mouth of Svendborg Sound. This deep-water channel, encompassed by shallow flats, and clinging close to the shore, may, in some cases, serve for a refuge; but we need say nothing further about it here than that it passes close round Vorre Knude, the south-west point of Taasing: leaves Vægterholm to the southward; and is interrupted off the north end of Strynö by an 8-feet flat, which must be crossed before deep water can be attained again off Langeland.

724. Between Fyen and the opposite islands of Taasing and Thorö, lies Svendborg Sound, the western mouth of which, on the Fyen side, is safe and clean, but on the Taasing side the shallows lie a long way out.* Half a mile to the westward of Yholm stands the outer beacon (a bundle of straw on a post), and the deep-water channel, all the way up to Svendborg, is marked by similar beacons along the Taasing side; whereas on the Fyen side they carry brooms. The depth of this narrow channel is everywhere 4 to 5 fathoms, except between St. Iörgen Hospital and Yholm, where the Dödemand Shoal, a ridge with only 15 feet water, stretches across the whole breadth of the channel. To the northward of the Dödemand there is another still narrower channel, with from 9 to 11 feet water.

Svendborg Sound.

Dödemand Shoal.

725. Off Yholm the southern shallow extends far out, and the channel, is therefore, close to Fyen; abreast of St. Iörgen Point it turns towards Taasing, round the point of the Skælfiske Ground, which consists of gravel, pebbles, and shells, in 2 to 4 feet water, and on the south side of which are placed two beacons with brooms. Between St. Iörgen Point and Svendborg ferry lies the Mose Ground, with 2 feet water on its shoalest part, formed of gravel and pebbles, and surrounded by a flat, with 1 to 2 fathoms, which is marked by three broom beacons, one on the middle and one at each end. Between the flat and the shore

Skælfiske Ground.

Mose Ground.

* See Plan on Entrance to the Baltic, Sheet III.

of Fyen there is a narrow channel, with a depth of 2 fathoms. On the flat of Lehnsholm there is excellent anchorage, in 2 to 2¼ fathoms, clean ground.

Svendborg. 726. At the northern corner of the sound stands the town of Svendborg, with its harbour sheltered from the ice by the Kohölm Shoal, abreast of it. The harbour is continually improving, and now admits vessels drawing 14 feet along the quays. The town has a lively trade, and considerable business in ship-building; it possesses also a slip large enough to haul up moderate-sized brigs. Fire and candle, however, are not allowed on board vessels in the harbour.

Current. 727. The current in Svendborg Sound is violent and irregular; its usual rate is from 1 to 2 knots; but during unsettled and stormy weather it increases to 3 or 4 knots, and prevails over the ordinary tide; for though the water may rise or fall pretty regu-

Tides. larly, yet the stream preserves its direction. In settled weather the flood comes from the eastward, and the ebb from the westward; the tide changes regularly every six hours, its general rise not exceeding 2 feet. North-east gales produce the highest water, sometimes 5 feet above the common high-water; south-west storms depress the water in the same proportion. North-west gales sometimes force the current in the direction of the wind for three to four days successively, yet without making more than 2 feet difference in the level of the water-stand, and without changing the regular rise and fall of the tides, though their direction may be disturbed. These circumstances, combined with the sinuosities of the sound, produce some curious effects on the water-stand: thus, during a north-west gale, the water at Svendborg, and to the westward, may be 3 or 4 feet lower than at Troense; whereas, with an easterly gale, which forces in the water from the eastward, it may be 3 feet higher, and even more at Svendborg than at Troense. The contrary phenomena as frequently occur when a west or north-west gale suddenly succeeds a south and east wind; and each of these cases may last for six to twenty-four hours.

Ice. 728. Svendborg Sound is occasionally frozen up, but the ice is sometimes cut through in a couple of hours by the action of the current, which is most violent a little to the northward of Ventepose mill, as was described in the chapter on the Great Belt (Art. 516); but, from the great strength of the current there, it

is the last part of the sound that ever freezes across. During calm weather the ice, coming in from the eastward, often packs itself round the mooring-piles at Svendborg in such a manner as to carry them away; but the first strong gale clears it all away.

729. The island of Ærö,* on its south and west sides from Æröshale (or the Ærö-Tail) to Veis Ness, and round to Skiold Ness and Oure Head, is edged by a narrow gradually-sloping shallow; but the eastern coast, between that head and Æröshale is connected by shoals and flats with Langeland, and is only separated from the islands of Strynö and Taasing by the Mörke Deep. There are two towns on the island, Æröskiöbing and Marstal; and, as both possess much shipping, they deserve a minute description. *Ærö Island.*

730. Coming from the westward, the passage to the northward between Ærö and the islands of Lyö, Avernakö, and Dreiö, is perfectly clear for small vessels, but larger ones have to avoid Skrams Flats, lying between Lyö and Avernakö, as already described (Art. 721); and farther in the Billes Ground, which consists of three separate flats, with a depth of 2 to 3 fathoms, on a bottom of sand and rock, and which is too steep to be approached by the lead, but may be passed to the southward by keeping Omel Head and Oure Head in one. The depth in this passage is from 11 and 12 to 20 fathoms, on mud and sleek; but it contains two small patches with 23 feet water, which are shown in the chart; and to the eastward of which Omel Head open E. of Oure Head will lead. *Billes Ground*

731. Off the eastern horn of Skiold Ness there is a small sand-flat, with 2 fathoms water, but steep-to, and plainly visible by the whitish colour of the sand; on which, however, there are a few rocks, with only 3 feet. From thence, along the north-eastern shore, the island is safe, a depth of 4 fathoms being found close to the shore. In the bay of Söby, from whence a ferry crosses to Mummark, on the eastern shore of Als, there is good anchorage, in 7 to 8 fathoms, clay, well sheltered against all winds, between S.S.E. and W.N.W., but open to northerly winds, which produce a rough sea. In a bay called the Revkrog, between Oure Head and Bregninge, there is yet better shelter, and against all winds, *Skiold Ness.* *Söby Bay.* *Revkrog.*

* See Entrance to the Baltic, Kiel Bay, Sheet IV.

except from between north-east and north-west, to which the bay is entirely exposed, and which occasion some difficulty in getting out. This anchorage is excellent with the wind from N.E. round by the southward to W.N.W., in 4 fathoms water, on stiff bluish clay, under a layer of mud.

Oure Head. 732. From Oure Head a reef extends to the northward about 4 cables' lengths, but as it gradually shoals, it may be approached by the lead.

Coming from the northward, attention must be paid to avoid a reef, projecting nearly 4 cables' lengths from the west point of Dreiö, and called Jensens Ground; there are 4 large rocks on it with 6 feet water, and 2 fathoms close to. Vessels drawing less than 10 feet may pass between the reef and the island, but all others must keep outside. If coming from the north-eastward, between Fleskholm and Korshavn, on the mark, Aaby church in one with the wood on the west side of Aaby rivulet, you may continue on it until Æröskiöbing church opens to the westward of Dreiö Wood, when you may pass inside the shoal by keeping Oure Head midway between Æröskiöbing mills, on which mark the least depth will be 11 feet. In working through, the marks for tacking are, to run Oure Head from the one mill to the other. The reason why Æröskiöbing church is to be run to the westward of Dreiö Wood is, to avoid a rocky shoal with 8 feet water, so as to pass between this shoal and the sand-reef that stretches out from the east end of Korshavn Island.

Jensens Ground.

Vessels drawing above 11 feet must pass outside of Jensens Ground by continuing in the mark with Aaby church and the wood until Dreiö church opens to the southward of the west end of the island; you will then have passed the shoal, and may proceed in 7 to 8 fathoms, towards Oure Head, if bound for Æröskiöbing, or towards the Mörke Deep, if going to Marstal.

Æröskiöbing Eastern Channel. 733. There are two channels to Æröskiöbing; one to the eastward of the small island of Deierö, which is the best, though it will not admit vessels drawing more than 12 feet. When standing for this inlet, in order to pass to the northward of Deierö, keep the whitewashed schoolhouse, which stands on the Marstal shore a little to the southward of the village of Omel, in one with the S.W. point of Omel Head, or in one with a single house on the ridge of the Marstal shore, called Sörens-house, and

continue on this mark until the whole town of Æröskiöbing becomes visible to the southward of Deierö; or, more properly, until a conspicuous whitewashed house, in the southern part of the town, is in one with the westernmost mill. You may then steer for the town; but whether going free or working, the lead is to be kept going, to avoid Omel Head Flat, on the eastern side of the channel, and two necks of sand extending from Deierö, on the other side. Between these two necks there is a good anchorage in 13 to 15 feet water; and inside of Deierö, between it and the town, vessels may anchor anywhere, but the best berth is abreast of the harbour. In the harbour there are only 7 feet water, but fire and candles are allowed.

734. To enter by the western inlet, which is narrow and intricate, but has a depth of 6 fathoms, you must steer W.S.W., when the village of Omel is just open to the northward of Deierö, and continue this course until Tranderup church is in one with a whitewashed rock lying on the low land south of Oure Head; and keep on this mark until two houses, standing close together on the ridge or highest part of the Marstal shore, a little south of the school-house, are in one with the south point of Deierö. Now steer on this mark about S.E., until Æröskiöbing mills become visible in the opening of the westernmost street of the town, and this mark will lead to the anchorage. This inlet is only practicable with a free wind. *Western Channel.*

At Æröskiböing there is a narrow inlet with 7 to 9 feet water inside of the small island of Lilleö; and small craft use it as a winter harbour. The southern part of the eastern inlet, a little to the southward of Omel village, may also serve the same purpose. *Winter Harbour.*

735. The Mörke Deep, though very narrow, is a channel of much importance; it separates the flat on which stand Hiortö, Birkholm, and Greenholm, from another large flat called the Flint Ground, which includes the Egholms, and connects them with the island of Halmö and the peninsula of Omel Head; and the western side of this channel is pointed out by 17 beacons. Between Birkholm and Egholm its depth is 6 to 7 fathoms; abreast of Bredholm 4; but farther in, at Greenholm, only 2 fathoms. To make this channel from the westward, you must not come to the eastward of the mark of Store Rise church in one with the northernmost bushes on Deierö, or Æröskiöbing church just open to the north-west of *Mörke Deep.*

that island, before Dreiö church is simultaneously in one with the western side of the high land, at the east end of Korshavn Island, or, which is a more distinct mark for entering the northern inlet in midchannel, keep Hesselbierg mill, on Langeland, in one with the S.E. point of Birkholm. Then, assisted by the lead, you may stand into the channel, but minding to run the church by degrees farther in on that high land, so as to bring it in one with the north-eastern side of the Korshavn hill by the time you arrive at the first beacon in the mouth of the channel. The shallows extending off Dreiö and Hiortö may with safety be approached by the lead; and in a like manner small craft may stand across Egholm Flat, which shoals gradually, and thus need not pay too strict an attention to the mark with Dreiö church, but may shape their course for the first beacon by bringing Strynö church in one with the S.E. point of Birkholm. Coming from the northward, the beacons are of course to be kept close on the starboard side. Small craft may work through, when the current is favourable, in very short tacks. There is, however, on the eastern edge of Egholm Flat, a small rocky patch with only 5½ feet water on it, but rising from a depth of 10 and 11 feet. It extends a cable's length N.W. and S.E. with a breadth of 30 yards, and the mark for its shoalest spot, is the two Egholm Islands kept well open of each other, and the houses on Strynö Kalv in one with the outer edge of Birkholm boat-pier. To pass to the southward of this patch keep Strynö mill nearly in one with the inner end of the boat-pier, and you will be to the eastward of it when the elevated cliff on the eastern side of Halmö is seen between the two Egholms.

Dreiö and Hiortö Shallows.

With Rudkiöbing church kept in one with the south side of Vorrekuude, a hummock on Taasing Island, you may stand in for the Mörke Deep until advanced as far as on one of the above leading marks for the northern part of the entrance.

736. Abreast of Greenholm the deep-water channel ends, as well as the series of beacons; but when the houses on Halmö open to the southward of Halmö cliff, the passage becomes wider and deeper. This last mark leads past Strynö towards Rudkiöbing; but if bound for Marstal, you must cross the wide intervening shallow, in the depth of 2 to 3 fathoms, taking care to avoid a shoal with only 6 feet water, lying just in the track. The eastern-most whitewashed rock on the beach of Greenholm, well open

Greenholm.

west of Bierreby church, in Taasing Island, leads to the eastward of it; and Marstal mill, open to the westward of the north-western house of the town of Marstal, clears the shoal to the westward.

When half-way between the Mörke Deep and the inlet to Marstal the shoal is passed, and then Marstal mill is to be brought in one with the whitewashed gable of the second western house in Marstal, which is the leading mark directly for the beacons. In working, a flat with 9 to 11 feet water, but rocky on its north side, and limiting the east side of this passage, is avoided by keeping Æröshale open to the westward of Langholm.

737. To the northward of Langholm there are four sandy patches, and between them three passages, all of which are well marked by beacons, but on account of their number it requires exact local knowledge to be guided by them. It may, however, be observed, that the sticks and beacons are to be left on the port side, except the two straw beacons which stand at the turn of the channel to the eastward, and which are to be left to starboard. The widest and most frequented of these channels is the western one, between Ærö and the sand-patches, as it leads directly to the harbour in 9 feet water and more. The middle passage, between the two middle patches, varies in depth, from 11 feet to 4 fathoms, and the eastern channel between the patches and the shallow off Langholm has in some places only 6 feet water, and both of these last-mentioned channels are so intricate and narrow, that they should be attempted only with a leading wind. They all join abreast of Marstal church, where 2 to 3 fathoms water will be found between Æröshale and Langö Sand, and there meet the southern entrance to Marstal; but on the long narrow flat that connects the islands of Ærö and Langeland, there are only 7 to 8 feet water; nothing but small craft, therefore, can pass this way, and it should be remembered, that south and south-west winds generally produce low, but north and north-easterly winds high water. *Marstal.*

738. To the north of Æröshale there is a small quay, the shallow off which extends along the coast of Ærö, until to the northward of Marstal.

On the northern spit of this shallow numerous large stones have been thrown, so as to form a sort of a breakwater to Marstal Harbour, which name is given to the narrow channel between the *Marstal Harbour.*

sand and the shallow along the shore, where, though the depth decreases from 9 feet to 6, there is a range of mooring-piles in the middle, so as to be considered a perfectly safe winter harbour.

Outside, the anchorage is bad, on account of the quantity of rotten seaweed, which frequently prevents the anchors holding; but pilots are in attendance when the signal is made, and they are bound to maintain the beacons in all these inlets, and therefore entitled to beacon-money. Fire and candles are allowed on board in the harbour.

Pilots.

Making Marstal from the southward.

739. Vessels endeavouring to enter from the southward, and meeting with contrary gales and bad weather, may anchor on the shallow between Æröshale and Veis Ness, and lie sheltered against all northerly winds, as far round as N.W.; and these winds are always accompanied by a current from the northward. Coming from the westward, the farmhouse on Veis Ness is not to be brought in one with Æröshale; if from the southward, Bierreby church on Taasing is to be brought in one with the house on Strynö Kalv, and this mark is to be followed until the west end of Langholm is in one with the house on Halmö. This will lead in till Marstal mill comes in one with the white-washed corner of a roof—the leading mark for the channel, which is pointed out by beacons.

Marks.

CHAPTER X.

LITTLE BELT TO THE BALTIC.

740. THE western angle of the Baltic, between the Danish islands and the shores of Slesvig and Holstein, is commonly called Kiel Bay, which may be said to begin at the southern extremities of Langeland and Als Islands, where the Great and Little Belts terminate. Article 619. *Kiel Bay.*

Between Poel Point, the southern extremity of Als, and the opposite peninsula of Birknakke, the spacious fiord of Flensborg stretches upwards of twenty miles into the province of Slesvig; and though in general deep and wide, yet in its mouth there are several extensive flats and shoals. *Flensborg Fiord.*

741. Poel Reef, on which there are only 12 feet water, lies 1¼ miles S.E. by S. from the point; but between it and the spit connected with the point, and called Poels-Bro (Bridge), there is a 3-fathoms passage. The marks to avoid this reef are, the eastern edge of Adzerballig Wood kept outside of Mummark Point; this clears it to the eastward, and Skiold Ness (the north point of Ærö) in one with the south side of a conspicuous ridge or highland on Fyen, a little to the eastward of Diernisse church,* clears it to the southward. *Poel Reef.* *Poels-Bro.*

Nearly 2 cables' lengths S. by E. from the 12-feet patch, a floating beacon lies in 6 fathoms, with a red pole and 2 brooms; and to pass it to the southward, Borris Wood is to be kept open to the southward of Keke Ness; or if it be too hazy to see Borris Wood, then keep the low point of Neuhof outside of the steep cliff of the Ness. Continue on one of these lines to the westward until Poel Point is about halfway between Skiold Ness and Söby church (in Ærö), and on this mark you may stand about W.S.W. in 7 or 8 fathoms through the deepest *Poel Beacon.*

* See View F in Chart, Entrance to the Baltic, Kiel Bay, Sheet 4.

part of the channel, between the shallow off Als and the Bred Ground.

Fleimose Sand. 742. The Keke Ness shallow, between Holmegaard and Osterbye village, is called Fleimose Sand; it is so steep as not to be approachable by the lead, but in the daytime it may be distinguished by the tint of the water, the bottom consisting of clean white sand. At Fisker Point a neck of sand stretches out from the village of Sönderby, where the bank is not so steep, and where small vessels may find good anchorage with north and easterly winds, by keeping the street of the village open.

Fisker Point Sand.

Bred Ground. 743. The Bred Ground is a large, insulated flat, between Als and Angeln (part of Slesvig), but dangerous only to large ships, as the depth is less than 3 fathoms on a small part only of the flat, with a single patch of 14 feet, towards which the water gradually shoalens from all sides. When on this shoal spot, Düppel mill* is seen between the south-western houses on the peninsula of Kekenæs and the church; and the mark to pass to the northward of the flat is Poel Point halfway between Skiold Ness and Söby church, as above mentioned. To pass it to the southward, bring Dünth mill between the north end of Borris Wood and the high hills to the northward (see view of the coast, marked B in the chart); and to clear it to the westward Lysabbel church, standing on high ground in Als, is to be nearly in one with the point of Keke Ness.

Keke Ness Light. 744. To facilitate the entrance to Flensborg Fiord and Als Sound, a Fixed Light has been placed on Keke Ness; it is elevated 78 feet above the level of the sea, and may be seen nearly 12 miles between the bearings of W. ¾ S. round by S. to E.S.E. ½ E.

Kalk Ground. 745 The Bred Ground forms two different inlets to the fiord; the southern one is the deepest and widest, but somewhat limited by the Kalk Ground, a long and shallow spit jutting out from Birknakke Point, and having on its shoalest part only 3 feet water. The marks to pass to the eastward or westward of this shoal are, Kekenæs church in one with the easternmost or westernmost houses of Sönderby village; and you pass to the northward of the spit in somewhat more than 4 fathoms when Dünth mill is in one with the southern hillock at Borris Wood (see view of the

* See note to Art. 692.

coast, marked B in the chart, *a* and *b* in one). When working through this channel, do not stand nearer to the spit than Dünth mill being between the two southernmost hills, as represented in the view of the coast marked B in the chart. If from hazy weather the mill be not visible, some trees to the southward of Borris Wood are to be kept open, and not allowed to shut on with the wood (see the view of the coast, marked A in the chart). About N. by E. ½ E., distant 3½ cables' lengths from the shoalest spot of the Kalk Ground, a floating beacon in 22 feet is placed, with a white pole and a red ball. These three objects, Lysabbel church, Düppel mill,* and Birk Wood, are all very conspicous, and are good guides and marks. The bottom in this channel is shingle near the Bred Ground, but sleek and fine sand nearer to the flat off the shores of Angeln.

Pass across the Kalk Ground.

746. Between the Kalk Ground and Birknakke Point there is a 9-feet passage across the sand, which is much frequented by vessels not drawing more than 7 feet, as the distance across is only half a mile. Coming from the eastward you may keep along the coast in 3 fathoms water, or follow the mark—Broager church open to the northward of Borris Wood until abreast of Albue (elbow) Point, and then steer more northerly, so as to run the church farther out; but when abreast of Birknakke Point, in 9 feet water, steer west until the depth is 5 fathoms, the reef being then passed. A good guide is generally afforded, but particularly in stormy weather, by the remarkable tint of the water over the light-coloured sand. Coming from the westward, do not approach the sand before the conspicuous mill at Steinberg, to the south-westward, is just open of the abrupt edge of a wood, when you may steer east, across the sand, into deep water outside.

Madsen Ground.

747. Another detached shoal, the Madsen Ground, has only 8 feet water where shallowest, and lies just in the track to and from Sönderborg. The mark to pass it to the southward is, the Kekenæs highland kept outside of the lowland west of it; it is cleared to the eastward by keeping the west side of Lamberg Wood in one with the west point of the peninsula Kekenæs, and to the westward by Hörup church, a third of the breadth of Lamberg Wood from its eastern edge. The mark for

* See note to Art. 692.

its shoalest rocks is the little steeple of Hörup church in one with the middle one of the three small green patches, near the beach at Hörup; and to pass to the northward, between it and Fisker Point, keep Düpple mill in one with a remarkable cleft in the beach cliff (see view C on the chart). S.S.W., about a cable's length from the shoalest spot of the Madsen Ground, in 3 fathoms, there is a floating beacon, with a red pole and a broom. If bound for Hörup Hav, you must avoid not only the Madsen Ground, but also the Trindel Spit, off the west point of Kekenæs, part of which dries, and is steep-to. To pass outside of it, keep some very tall trees in one with the Ferry-house, which is the westernmost house in the village of Hörup; and by keeping open the road to those houses, you may stand in and bring up, in 5 fathoms, on excellent holding-ground, and sheltered in all points, although S.E. winds may occasion some swell; but even this may be avoided by running farther in, recollecting, however, that it will of course be more difficult to get out. This fiord, being frequented only by vessels that load or unload there, might afford a winter harbour to vessels of any size. The shallow along the south side of Als is an anchorage much resorted to by coasters.

Hörup Hav.

Trindel Spit.

Venning Bond. 748. The bay of Venning Bond, on the Slesvig shore, between Düppel Point and Salling Head, trends to the westward, has a depth of 9 to 14 fathoms, and the shallows are so narrow that 5 to 7 fathoms are found at the distance of 1 to 1½ cables' lengths from the shore. Just inside of Salling Head there are 7½ fathoms close to the beach; but the bay is entirely open towards the S.E.

For the entrance to Als Sound, and Sönderborg, see Articles 694 and 695.

Helts Flat. 749. To the southward of this bay, and off Borris Head, lies Helts Flat, with 16 feet on its shoalest part, and a steep face to the southward from 6 fathoms to 23 feet. Between it and the shallow off the shore there are 7 to 8 fathoms; and you pass it to the southward in 6 fathoms by keeping Lysabbel and Kekenæs churches in one.

Gelting Bay. 750. Between Birknakke Point and Haber Ness lies the large bay of Gelting, which recedes from the line of coast 2½ miles, with a depth between the outer points of 11 to 13 fathoms of sleek; and farther in gradually decreasing over a

bottom of sand and seaweed. The shallow along the shore, from the point of Birknakke to the inner bight of the bay is 7 or 8 cables' lengths in breadth, but from thence it rapidly narrows towards Haber Ness, which is steep-to from 4 fathoms, with rocks along the beach. In the bay, about a mile from Quisnæs Point, there is a small flat, with 21 feet water, and separated from the shore-shallow by a passage, with a depth of 5½ fathoms, on a soft bottom; the mark for which passage is, Hörup and Kekenæs churches in one. N. W. ½ N., a mile from this flat, there is another, with 20 feet water. To the northward of the flat off Quisnæs large ships will find good anchorage in 8 fathoms, with Broager church in one with the south end of Borris Wood, and Hörup church open to the westward of Kekenæs church. Small vessels may anchor anywhere on the shallow in a convenient depth, and find shelter against all winds, except from between N.E. and N.W.

751. Off the cliffs of Haber Ness a sandy spit extends N.N.E., and its outer point is quite steep from 8 fathoms to 7 feet. *Haber Ness.*

To the westward of Haber Ness and of the spit, and between them and Nykirke, there is a bay in front of Haber Ness village, along which the shallow is only 1½ cables' lengths wide, and consists of sand, with a few rocks near the beach. Abreast of this bay, and a mile off shore, lies the Nykirke shoal, a cable's length in diameter, carrying but 8 feet water on its shoalest part, and steep-to all around. On the north side of the shoal, in 15 feet water, there is a floating beacon, with one broom. To pass close to the westward of this shoal, the summit of Düppel Berg is to be brought in one with Helts Point, the eastern extremity of Borris Head; and to pass it equally close to the northward, Hede mill, on Als, is to be in one with Kekenæs church. *Nykirke. Ground.*

752. Round Borris Head the shallow extends only 2 to 3 cables' lengths, but it is very steep-to, particularly off the Krage Sand, where it drops from 9 feet into 9 fathoms. To the westward of the Krage Sand the shallow is very narrow, as far as the next point, from which a reef extends 3½ cables' lengths to the northwestward, with only 10 feet, though close to it there are 3 fathoms. In a small bay to the northward of the reef small craft may anchor in 15 to 18 feet water, soft bottom. *Krage Sand.*

753. We now enter the narrow part of Flensborg Fiord, between Borris Head to the northward and its opposite headland, *Borris Head.*

Haber Ness, and at 4 miles from the former we come to Bruns Ness, where the fiord suddenly turns to the northward. From *Bruns Ness.* Bruns Ness a ferry crosses to Hol Ness, on the opposite side of the fiord; along the former shore the shallow widens, and forms a sandbank projecting half a mile W.S.W. and W.N.W., gradually shoaling from the westward, but steep on its southern and eastern sides. On its south spit, in 21 feet water, and bearing S. by W. five-sixths of a mile from the end of the ferry pier, *Buoy.* a black buoy with a staff and broom will be seen. From Bruns Ness to the tile manufactory at Rennberg the shallow consists of sand and seaweed, with shallow water in the little bay north of Bruns Ness; but farther north it is narrower and steeper, with only 3½ cables' lengths to the depth of 4 fathoms. On the south side of the fiord, from Nykirke to Hol Ness, the shallow is but 1 or 2 cables' lengths wide, and slopes steeply to 5 fathoms. Between Nykirke and the rivulet of Langballie the flat is rocky, but from thence to Hol Ness the bottom is sand *Langballie Rivulet.* and seaweed. Langballie rivulet is dammed up by a sluice, up to which there is a narrow inlet with 2 to 3 feet water, and marked by sticks, but admitting only small boats.

Langballie Sandbank. About two-thirds of a mile north of Langballie rivulet there is a long detached sandbank, with a depth of 20 feet on its shoalest part; it lies N.W. and S.E., and is not 2 cables' lengths across, but steep-to on each side, though it gradually slopes at the ends. On this bank there is good holding-ground, and accordingly it is frequently used as an anchorage in preference to other parts of the fiord where the depth is greater.

Hol Ness. 754. At Hol Ness the fiord turns short round in a south-west direction, towards the town of Flensborg, and as this part of it is perfectly land-locked, it may be considered as a spacious harbour. *Custom-house.* There is a custom-house at Hol Ness, and vessels bound to Flensborg, or to other places up the fiord, have to report there; for which reason landing-piers have been erected on both sides of the point. In cases when it might be dangerous to stop and anchor there, they are allowed to proceed to the town, and in those cases the custom-house at Hol Ness shows no flag (Art. 763).

Hol Ness Hage. Two large shallows are attached to the end of the peninsula: 1. the Hol Ness Hage, a large flat nearly dry at low-water, and extending 4½ cables' lengths from its north-east point; its outer edge is steep-to, but just off its extreme point, in 3 fathoms, there

is a white buoy with a pole and a broom. Along the inner side of this flat there are 3 and 2 fathoms, and at the northern pier in the bay 10 feet.

2. From the north-west side of the peninsula the Skidenkind shallow, with only 2 feet water, projects 3½ cables' lengths, and then steeply falls into 4½ fathoms. On the spit of this sand there is likewise a white buoy with a pole and a broom, in 3½ fathoms, and distant about a mile from the former buoy. Again, W.N.W. 2 cables' lengths farther, a third buoy lies in 16 feet; and finally, N.W. ½ N., 3 cables' lengths from the third buoy, there is a fourth white buoy, but it has neither pole nor broom, and lies on the outermost spit of the shoal, just opposite to Dalsgaard, on the northern shore, in 4 fathoms water. *Skidenkind Flat.*

755. From the Skidenkind the shallow turns south-westward, gradually deepening to 4 fathoms at 3 cables' lengths from the beach as far as Moes tile manufactory. It is narrow and steep from thence to Meiervig, but there it increases to 2½ cables' lengths in breadth, and is perfectly steep from 6 fathoms to 9 feet. This part of the shallow is called the Mölle Ground, after passing which it again becomes very narrow. *Mölle Ground.*

Farther up the fiord the Kielseng Shoal extends 2 cables' lengths from the shore in a W.N.W. direction, with a depth of a foot only, and dropping abruptly to 4 fathoms; off its western point there is a buoy with a broom and a flag. *Kielseng Shoal.*

756. From the tile manufactory at Rennberg to Eken Sound, the shallow along the shore is narrow and steep, and abreast of this part of the shore, between Eken Sound and Hol Ness, there are several small patches, but the least depth on them being 21 feet, they need be avoided by ships of the line only. West of Eken Sound lies Rinkenis Bay, and as far as Dalsgaard the shallow, consisting of sand and weed, is two-thirds of a mile wide to the limits of 4 fathoms, to which depth it gradually slopes, consisting of sand, seaweed, and in some places rocks. On the southern edge of this shallow, which is very steep from 8 fathoms to 16 feet, there is a black buoy 4½ cables' lengths from the shore, and just opposite to the outer buoy on the Skidenkind. From Dalsgaard to Sandager Point the deep water lies two-thirds of a cable's length from the shore, but off the point the shallow extends 2 cables' lengths; and distant 2 cables' lengths west of the point there is a small patch with 21 feet water. *Rinkenis Bay.* *Dalsgaard.* *Sandager Point.*

Munke Point. 757. From the point at Munke mill all along the shore inside the Oxen Islands and into the bay at the Copper Mill the shallow is clean, and from 1 to 2 cables' lengths wide, and continues thus all along shore until off the south end of the wood, where the 4 fathoms line forms a neck extending 3 cables' lengths from the *Battery Shoal.* shore. Abreast of Steenbro Point the Battery Shoal has but 3 feet water at the distance of a cable's length from the beach, but on its steep edge in 3 fathoms there is a buoy with a flag and a broom. To the southward of the Battery Shoal the shallow is steep, but farther in it slopes gradually up from 4 fathoms to one. On the edge of the channel abreast of Kielseng Shoal there is a 13-feet patch, but inside of it a depth of 20 feet. The channel between this patch and the buoy of Kielseng Shoal leads direct into Flensborg harbour, but it is only two-thirds of a cable's length wide, though 5 fathoms in depth.

Oxen Islands. 758. Abreast of Süderhof lie the small islands of Oxen; their southern ends are connected by a flat with 5 to 6 feet water, which gradually deepens towards the fiord; but between them to *Oxen Harbour,* the northward, there is an inlet with 3 fathoms forming an excellent land-locked harbour. Opposite to the smaller island, a dry and steep neck of sand projects from the shore, which is marked by a beacon or pole in the ground, as well as the end of a short reef extending from the island. The least depth between the shore and the islands is 3 fathoms, and the channel is marked by small beacons. Off the south end of the eastern island a reef projects for a cable's length towards the S.E., which should be *and Ship-yard.* avoided. On the other island there is a ship-yard, where small craft are hove down and repaired.

Middel Flat. 759. Abreast of the wood, between the Copper Mill and Steenbro Point, the Middel Flat lies nearly mid-channel; its least water is 15 feet, but it occupies a large portion of the channel, being 5 cables' lengths across from the 3-fathoms line on either side. To the north-west of this flat, in Copper Mill Bay, there is another patch with 19 to 20 feet water, but only a cable's length across, between which and the shore-shallow there is a narrow 4-fathoms passage, and between the two flats a wider channel with from 4 to 6 fathoms. Finally, on the eastern side of the fiord to the north-east of Kielseng mill lies another but very small patch, with 21 feet water, the inner edge of which is $1\frac{1}{2}$ cables' lengths from the shore. The general depth of the fiord inside of Hol Ness

is from 7 to 11 fathoms, sleek and mud with seaweed along the shores, and in some places sand.

760. With due attention to the marks for the Helts Flat off Boris Head, on which the least depth is 16 feet, and for the Nykirke Shoal off Haber Ness, the course into the Flensborg Fiord is W.N.W. Keep in the midchannel, and when the high whitewashed ferry-house at Hol Ness is well open of the south point of Bruns Ness steer N.W. towards the Bruns Ness buoy, and when the mill at Eken Sound comes in one with the east point of Hol Ness, change the course to N. by E., and again to N.N.E. ½ E. when abreast of Bruns Ness ferry-house, passing close outside the buoy on Hol Ness Hage; then bear away W.N.W. in 5 or 7 fathoms, but keeping the three white buoys of Skidenkind to port, or if they should not watch, Dünth mill in one with the south end of a small grove at Eskfeld will lead close to the northward of the N.W. Skidenkind buoy in 23 feet water. Between this buoy and that of Dalsgaard is the narrowest part of the channel, being only 2¼ cables' lengths wide, with the depth of 6 to 8 fathoms and steep-to on the north side to 16 feet. The south side is less steep, but even from 3 fathoms to 3 fathoms, the breadth of the channel is only 3 cables' lengths. When past all the buoys of Skidenkind, the course midchannel is W.S.W. as far as the Mölle Ground, when S.W. ½ W. will lead between the buoys on the two opposite necks of sand, and from the Kielseng buoy the course is S. by W. ½ W. into the harbour. *Flensborg Fiord—Sailing Marks.*

If these buoys are not in their places, you may steer for the harbour by keeping the Luderhouse, which stands on the hill above the town, close to the westward of the steeple of Frue church.

761. When working through the inner part of the fiord tack off the flat of Sandager Point when Broager church is just open of the N.W. point of Hol Ness, and off the Munke mill shallow before Broager church is in one with Sandager Point, for on that mark the water suddenly shoals from 20 to 11 feet. With Eken mill opening just outside of Sandager Point you are in a fair track for the Mölle Ground; but off the north-east end of this shallow you must tack when the south point of the wood to the northward of Steenlyo comes in one with the north point of the shore. The mark for the eastern side of the Middel Flat in 3 fathoms is, a little straw-thatched house on the north *Working Marks.* *Middel Flat.*

side of the fiord in one with a small tile-roofed house close to the eastern edge of the wood.

Flensborg Harbour.

762. The depth in Flensborg Harbour is in general from 22 to 27 feet, with a muddy bottom, but in one place there are 8 fathoms. In the interior part of the harbour there are transporting buoys and mooring-piles, and along its western side there are quays, a careening place for large ships, a masting-crane, and a slip. Vessels drawing 16 feet may lie alongside the quays, though they need dredging, particularly the space to the northward of the crane. Between Gaardende and St. Iörgen they are now constructing quays along both sides, and will be able to procure a depth of 6 feet by dredging. All vessels will find here an excellent winter harbour, and every kind of necessaries, as might indeed be expected in a place of so much commercial consequence as the town of Flensborg. No fires nor candles are allowed on board the shipping in the harbour.

The following are fees to be paid :—

Port Charges.

	Rbsk.
1. Wharfage per com. last :—	
Foreigners	32
Those in ballast	28
Home vessels in ballast	16
2. For sojourning in the harbour during a winter :—	
Foreigners per com. last	16
Home vessels	8
3. For vessels not coming to the Quays per com. last	16
Foreign small craft	28
Home ditto	16
4. Small craft belonging to places in the fiord, but not entered at the Custom-house per com. last	8
5. Construction fees for building vessels, per foot keel	40
6. Weigh-money to the Custom-house per 100 lbs. nett	4
7. Ditto to the town for everything weighing less than 160 lbs. for heavier things pr. 320 lbs. .	8

Flensborg Fiord Anchorages.

763. From Sandager to Flensborg, as already said, may be considered to be one large sheltered roadstead, where vessels may come to an anchor on either side in 6 to 8 fathoms, on a soft

bottom; and small vessels may find good anchorage with winds from N.E. to S. on the shallow along shore from Hol Ness to Moes tile-kiln, on the mark of Rennberg tile-kiln in one with the north-west point of Hol Ness in 2 to 4 fathoms mud, and in some places clay. Inside of Hol Ness Hage, on the flat between the northern pier and the tile-kiln there is a good anchorage for vessels of all sizes, with winds from S.E. round by S. and W. to N.W., whether anchored in the channel or on the flat, according to their draught, near the shore, the bottom being soft. With a northerly gale small craft ought to get away round Hol Ness Hage and bring up abreast of the southern ferry-pier, where the shallow is steep-to from a depth of 6 fathoms a cable's length from the pier-head. The colours are hoisted at that pier, off which it may be safest to anchor according to circumstances. (Art. 754.)

Colours hoisted at Hol Ness.

764. In Rinkenis Bay small vessels may enter by passing just to the southward of the outer buoy of Eken Sound, then steering N.W. by W., and then anchoring in a depth of 12 feet, mud bottom, with Nübel mill midway between the two points of Eken Sound, taking care to avoid a small shoal with 2 feet water $3\frac{1}{4}$ cables' lengths from the shore. Dalsgaard bears from the shoal S.W. by W., and you pass to the northward of it by keeping Broager church in one with the flagstaff at Rennberg.

Rinkenis Bay.

765. On the flat extending off Bruns Ness ferry-pier, anchorage will be found and shelter against E. and S.E. winds. Small craft may anchor in a convenient depth farther in; but the holding-ground is indifferent, being soft with much seaweed. The holding-ground is better to the S.W. than to the N.E., when well in, but still it is indifferent in soft bottom with seaweed; it is likewise better to the S.W. than to the N.E. of the ferry pier.

Bruns Ness.

766. The Nübel Nor is a sheet of water connected with the sea by Eken Sound, which is a deep but narrow strait leading first N. $\frac{1}{2}$ W., then curving to N.E., and then nearly to east into the Nor. At the outer end of the Sound there are four buoys, viz., two lying to the eastward, in 10 feet water, on the edge of the steep shallow; one to the westward, in 14 feet water, on the outer spit of sand which extends 4 cables' lengths; and the fourth near the edge of the western shallow, in 11 feet water. Abreast of the two innermost buoys the sound takes a N.E. direction, with a depth of 5 to 8 fathoms between the opposite

Eken Sound.

points, which are only 2 cables' lengths apart. The channel then passes close to the ferry-pier on the southern shore, and continues, with deep water, though very narrow, into the middle of the fiord, in the northern part of which the basin extends 6 cables' lengths each way, and with a depth of 4 to 6½ fathoms, the bottom mud with seaweed and clay, and thus adapted to vessels of any size.

Bösser Hage. 767. The shore-shallows round this land-locked sheet of water, slopes up gradually to the beach, except on the two shoals which surround and form the inner basin—the Bösser Hage and the Stierne Ground; the first extending along the whole of the southern shore, and about 4 cables' lengths in breadth; and the other, the Stierne Ground, which stretches along the western shore, and carries but 5 feet water at the distance of 3 cables' lengths from the beach. Between these banks there is a small patch with only 10 feet water, but to the southward of it in the channel, which is half a cable's length across, there are from 4 to 7 fathoms; and in the still narrower channel, on the north side of the patch, 3 to 4 fathoms. To the westward of the patch, farther out, between the ferry pier and Gravensteen Point, there is a much larger shoal, with only 4 feet water over sand and seaweed. The deepest channel leads to the southward also of this shoal, between it and the ferry-pier: it carries from 4½ to 6 fathoms, and is not much more than a third of a cable's length across. To the northward of the shoal there is an extremely narrow pass with 3 or 3½ fathoms.

Stierne Ground.

Gravensteen Shoal.

Nübel Nor. 768. The Nübel Nor is a remarkably good harbour for vessels of all sizes, but not of much consequence except as a military station. It may be further observed, respecting the entrance, that after passing the outer shoal, Nübel mill in one with the north end of a wood near the beach leads to the southward of the inner patch, and just clears Bösser Hage, and when Broager church becomes visible inside the wood you must steer N.E. ½ N. and N.E. into the deep-water basin, and bring up in 5 fathoms with Nübel church in one with the tile-kiln to the southward of the wood.

769. In the estuary, abreast of the village of Eken, a creek branches off to the westward of Gravensteen Point, and may be entered by keeping near the shore of Gravensteen. The depth decreases gradually towards the inner end of this creek, the

bottom of which is mud and seaweed, and offers good anchorage to small craft in 13 to 17 feet water.

At Eken there is a very large manufactory of bricks and tiles, which, from their excellent quality, are in high repute, and many small craft are engaged in their transport. From thence a ferry crosses to the opposite shore, and small craft may be hove down or hauled up on a slip for repair.

Pilots for Flensborg and Sönderborg are stationed off Birknakke Point and Keke Ness, and, according to circumstances, proceed from one or the other place to vessels making the usual signals.* *Pilots.*

770. From Birknakke Point to the southward towards Slimünde, the shallow along the shore of Angeln is very broad, and shoals gradually; but having on its northern end some sandy patches with a little more than 3 fathoms water, large ships ought not to stand nearer to it than to bring Broager church well open to the northward of Borris Woods. Farther to the southward the shallow is still more gradual, and abreast of Oehe Gaard, on that part of the bank called the Oehehav, there is good anchorage with westerly winds. To the north-eastward of Slimünde the shallow, called Sli Sand, extends much farther out, but may be safely approached by the lead to the depth of 4 or 5 fathoms: the bottom there is coarse sand and shingle; but within 3 fathoms no vessel ought to come, as there are some rocks off the old inlet. *Oehehav Bank.* *Sli Sand.*

771. Slimünde is at the mouth of the Sli Fiord, which is very narrow all the way up to the town of Slesvig; and the access to the fiord is formed by piers of stone and wood, between which a channel has been dredged out. On its south side there is a stone pier surrounded by piles, off the outer end of which lies a black-painted buoy, and on the shore a white beacon with a square table and a barrel on the top. On the north side there is a pier of stone 450 feet long, and surrounded by piles; on the extremity of which stands a beacon, consisting of a high pole with a triangle, and above all a barrel. Inside there are three mooring-posts along the edge of the shallow. Between the outer pier-heads the breadth is 349 feet, but the channel, with 12 feet water, is only 80 yards wide, and along the piers the water is very shallow. *Slimünde* *Slimünde Beacon.*

* The Birknakke pilots reside near Duttebül mill, to the southward of Birknakke.

Pilots. The north side of the inlet is formed by a small island, and there the pilot lives: he attends when the signal is made, or, if prevented from going off by the weather, he hoists a flag on the pilot-house. The shallow off this northern shore forms a neck of sand with only 10 feet water, but inside of it there are from 12 to 14 feet, and off the southern spit of this sandy neck 17 feet water. Outside of the spit lies a black buoy bearing S. by E. ½ E., distant 2 cables' lengths from the harbour beacon; and abreast of the inlet there is a large buoy, marked Slimünde (Sli Mouth).

Sli Fiord. Coming from the northward, and bound for the Sli Fiord, stand no nearer to the shore than into 3 fathoms, and when so far to the southward as to bring the flagstaff at the pilot-house in one with Vormshöved mill, steer W. for the buoy, which, having passed to the southward, run direct for the harbour beacon; but in so doing leave the small buoy to the southward, and steer N.W. ½ N. between the harbour moles towards the innermost mooring-post, where the anchorage is good. Small vessels, not drawing more than 8½ feet, may stand across the sandy neck outside, by keeping the southernmost house in the village of Mæsholm in one with the middle of the harbour's mouth, and in one with a post standing inside the mouth.

Coming from the eastward, keep the pointed steeple of Kappeln church in one with the middle chimney of the mansion of Olpenis, which may be known by its red tiles and three white chimneys; and steer in this mark W.N.W. ½ W. until the harbour beacon bears N. by W. ½ W., when the depth will be 3 fathoms, and the distance from the buoy about 2 cables' lengths, then proceed as directed above.

Coming from the southward, coast along 2 to 3 cables' lengths from the shore, and steer for the mark of the outer buoy as before directed.

Tides. 772. The tide-stream in Slimünde is strong, sometimes at the rate of 2 knots; with easterly winds it runs in and produces a high water-stand, and with westerly winds the converse takes place, but this only lasts for a couple of days; in general it runs regularly out and in. On account of this uncertainty of the water-stand it is advisable to take a pilot, though the inlet has

Port Charges. no difficulties, the more so because vessels pay 10 rbsk. per com. last, either inward or outward bound, if they have no pilot; and to run up the Sli a pilot is in all cases necessary. Open boats

with cargoes pay 26 rbsk. both in and out, except when loaded with fish or fruit, when they pass free, even when not taking a pilot.

773. Vessels not bound for the Sli, but only running in from contrary winds, pay beacon-money at the following rate:—

Foreigners, . . .	6 rbsk. pr. com. last.
Home vessels . .	3 ditto.

Slimünde Harbour.

774. The natural mouth of the Sli, between the Mindholm and Steendys, is entirely barred by a very shallow reef, which must be avoided when working along the shore, by not standing farther in than until the lookout-house, on the north point, is in one with a remarkable hedge on a hill some distance inland.

In Slimünde harbour the depth is from 11 to 13 feet, with sufficient room for about 40 small craft. From the mooring-posts to Mæsholm, the course is first N.W., through a narrow gut, which has been dredged out to a depth of 8 feet; and when the two mills on Vormshöved are in one, the channel turns W. by S., between the two ranges of poles used for the herring nets; but they much encumber the navigation, by leaving only a very narrow channel between them. The depth in this channel is from 13 to 18 feet; its north side being marked by beacons, and beacons with brooms are also placed on each side at the west end of each range of poles. On the north side there are two mooring-posts outside of the fishing-net poles. Farther in there are from 9 to 10 feet water, and close along the south-west point of Mæsholm are placed mooring-posts; but attention is required to avoid a reef, with 6 feet water, extending S. ¾ W., 2½ cables' lengths from Flintholm.

Custom-house.

775. Every vessel, whether inward or outward bound, is obliged to show her colours, and heave to, or bring up at Mæsholm; and the master is bound to report at the custom-house there. If the custom-house officer is absent, the flag at Mæsholm is hauled down, but otherwise it is always hoisted during daylight.

The Sli, up to Slesvig.

776. In the bay to the northward of Mæsholm there are from 6 to 8 feet water, and a good road for small vessels, abreast of Vormshöved mill. From Mæsholm a spacious and deep-water channel leads to Kappeln, but there it is again narrowed by rows of poles for the fishing nets, which continue beyond the peninsula of Arnis, and up to Svanebierg. At Sliesby, the channel again widens, but from thence to Louisenlund in general narrow, and

particularly at Messunde Ferry and at Kielfoth Point; and to pass all those different narrows it is necessary to have the wind between E.N.E. and E.S.E. Vessels drawing 7½ feet may come up to Kappeln, which with Arnis and Mæsholm own 135 small vessels, built there or at Rabelort; and between them they export a large quantity of provisions. In none of these different harbours is it allowed to use fire or candle.

Kappeln, Arnis, and Mæsholm.

777. From Slimünde southward to Schönhagen, the shallow along shore gradually slopes up from the depth of 4 fathoms to 2 at 4 cables' lengths from the beach; but off Nordhage Point a reef extends E.S.E. 2 cables' lengths, the innermost one consisting of large rocks above water, and the outer one sunk, with 11 feet water on its point. From thence to Bockenis Point the coast is clean, and steep, there being 4 fathoms at 2 or 3 cables' lengths from the shore. With westerly winds good anchorage may be taken in 5 to 8 fathoms; the best berths are abreast of Aalbek and Elhof, on a bottom of fine sand and clay; whereas off Nordhage the ground is foul. At Bockenis Point, the northern limit of Eckernförde Bay, there is a small reef, extending 1½ cables' lengths, and to the N. and S. of it some rocks lie close to the beach.

Eckernförde Bay.

778. Eckernförde Bay is perfectly clean inside, but there are two shoals in the offing, the Middel Flat in its mouth, and the Stoller Ground farther to the eastward. The headland, which separates the fiords of Eckernförde and Kiel, is called the Danish Wohld and an extensive bank with 5, 6, and 7 fathoms water, which forms as it were a continuation of this promontory, suddenly rises at about 2 miles from the shore into the Stoller Ground, with only 16 feet on its shoalest part. On the Middel Flat, as the least depth is 22 to 24 feet, it need not be avoided by any but very large ships.

Stoller Ground.

Middel Flat.

Between these shoals, and also to the northward and southward of them, vessels of all sizes may freely pass; if coming from the eastward they will see at a great distance Nienhof Wood, which stands on the high land to the southward, and on a nearer approach Wabs church on the northern side of the bay.

779. The position of the ship, as determined by cross bearings, as well as the views of the coast, will lead her clear of the above-mentioned shoals; but the following marks will also be useful. To pass close to the northward of the Middel Flat, bring a

remarkable cluster of seven tall trees, on a hill near Hummelmark, to bear W. ¼ N., and in one with a small house on the edge of the wood to the southward of Carlsmind. To pass it to the southward, bring the steeple of Eckernförde church to bear about W. ¼ N., and in one with the yellowish cliff of Röde Mölle (red mill) to the southward of Hummelmark, and near the beach. To pass to the N.E. of the flat in 4½ fathoms water, bring Kleine Wabs church to bear N.W. ¼ N., and in one with Strandbek House.* The mark for the mid-channel, between the Middel Flat and the south shore of the bay, is to keep Eckernförde church in one with the edge of the wood to the southward of Louisenberg.† This is the leading mark until nearly abreast of the before-mentioned yellowish cliff of Rode Mölle; you must then keep more to the southward until the conspicuous green mill, in an elevated position to the northward of the town, is in one with the pier-head of the harbour, which mark leads clear of the point in 6 fathoms. *Middel Flat.*

With a free wind you may run up the fiord by steering direct for Windeby mill, or W. until Louisenberg Wood (the last wood to the northward) bears N., when you will be nearly on the mark of the green mill in one with the pier head of the harbour.

780. To pass to the southward of the Stoller Ground, keep Kleine Wabs church N.W. by W., over a broad but not deep cleft about a quarter of a point from the northernmost of two white cliffs on the beach under Wabs. These cliffs are nearly equal in length, and are separated by a piece of greenish land; and on this mark you will not have less than 5 fathoms. When on the southern edge of the Stoller Ground, in 4 and 4½ fathoms, the cleft is in one with two mills in the southern part of Kleine Wabs; and when on the shallow, near Nienhof, in 4 fathoms it is in one with the northernmost houses of Wabs. Another mark is—keep two very conspicuous trees standing alone to the southward of Kleine Wabs, just open to the northward of the southernmost white cliff; you may keep the trees from midway between the cliffs towards the centre of the southern cliff, and you will not have less than 4 to 4½ fathoms on either side. In very clear weather, a third mark is Eckernförde church steeple kept well open off Nienhof *Stoller Ground.*

* View 42. † View 43.

Point, for the south side of the channel. Coming from the N. and W., approach the land to 2 or 3 miles in 8 to 12 fathoms until you have one of the above marks on, when you can steer through the channel; and when Bülk light is in one with Friedrichsort Point you are to the eastward of the Stoller Ground. Coming from the eastward, you must have one of the leading marks on before Friedrichsort Point comes in one with Bülk Light.

The 4-fathoms channel mentioned above, being only a little more than a mile in breadth at its narrowest part, vessels drawing more than 18 to 20 feet should not attempt it, except under favourable circumstances, and with the lead kept constantly going.

The current is said to have formed a channel on the South and S.E. ends of the Stoller Ground deeper than is shown on the chart.

781. Eckernförde Bay is perfectly safe, without any shallows of consequence, and vessels of all sizes may work in. Pilots are to be had from Eckernförde when the signal is made, and in the mean time you may anchor anywhere; but large ships ought to bring up in the mid-channel, for though the depth is great, the bottom there consists of tough mud, affording good holding-ground. Off the town of Eckernförde the depth is 5 to 10 fathoms, likewise good holding-ground, and the best anchorage is between the low point, projecting from Borreby mill and the town. When the point off the north shore shuts in with Nienhof Point you will have 8 fathoms water, and be sheltered from all winds; but large ships, to which the sea produced by easterly winds is of no consequence, may ride farther out. In the upper part of the bay, where the depth suddenly decreases from 4 fathoms to 11 feet, seaweed is found everywhere. During the night the harbour light on the pier-head, bearing N.W. by N., will indicate the most convenient anchorage.

Eckernförde Harbour Light.

Eckernförde Harbour.

782. The harbour of Eckernförde, to the northward of the town, and conveniently arranged with quays and mooring-posts, admits vessels drawing 14 feet, but those drawing more than 10 feet cannot come alongside the quays. There is a ship-yard there, and resources of all sorts, and fire and candle are allowed in the harbour. A buoy is placed S.E., a cable's length from the mouth of the harbour.

This bay and harbour are seldom frozen up; even when Kiel

and Flensborg fiords have been for several weeks, Eckernförde has sometimes remained open.

Vessels pay half pilotage when no pilot is employed, and foreigners, as well as national vessels not belonging to the place, pay double the amount of home vessels. The pilots have the monopoly of carrying ashore or on board all persons and goods; and they take vessels to Nyborg, Fredericia, and Neustadt, as well as to adjacent places. *Pilots.*

783. Off the Danish Wohld, between the points of Nienhof and Bülk, the shallow along shore is pretty wide, but gradual; the shallowest part is off Bülk, and is called the Kleverberg. *Kleverberg Shallow.*

784. In the S.W. corner of Kiel Bay, the fiord of that name stretching to the westward, forms a harbour nearly without a parallel. In coming from the northward, the most conspicuous object will be the high land of Nienhof, but when coming from the eastward, the yet higher land at Hohwacht; and in either case, on a nearer approach, the wood, the point, and the light-house of Bülk will appear as the fiord opens. *Kiel Fiord.*

The above-mentioned flat of the Stoller Ground may be crossed on its eastern side by the lead, as well as the Colberger Flat, which gradually shoals until abreast of the village of Stein, where it is too steep to be safely approached by soundings. Between these two banks there is a wide open passage with a depth of 9 to 10 fathoms, and sleek bottom. *Stoller Ground.* *Colberger Flat.*

785. The Fixed light of Bülk stands on a tower of 33 feet in height, and 55 feet above the sea, and serves to lead into the mouth of the fiord at night. To the eastward of the light, the shallow is gradual, and therefore it ought to be a general rule, in making this fiord at night, to keep on the western, or the Bülk side, for the bank between Stein and Labö is steep-to, with a white sandy bottom. In daylight you may stand in by keeping Kiel church steeple in one with the eastern edge of Düsternbrook Wood, which is some distance to the N.E. of the town of Kiel; and by keeping the steeple in one with the tower in Friedrichsort you will pass along the edge of the western shallow in 3½ fathoms. Ships of the line ought not to bring the steeple inside of the south angle of the ramparts of Friedrichsort before Nienhof is run behind the low point of Bülk, when you may stand nearer the western shore. *Bülk Light.* *Entrance to Kiel Fiord.*

786. The steep Labö Sand may with due precaution be ap- *Labö Sand.*

proached by the lead from the eastward, but by no means from the westward. When entering the fiord in the night, bring Bülk light to bear W. when in 5 fathoms water, then steer S.W. by S. towards Friedrichsort, off the low point of which there is a short reef, which is steep-to; and on the low point a beacon, 19 feet high, painted white, and shaped in the form of a truncated pyramid. In the daytime this reef is passed by attention to the beacon, or by keeping Kiel church in one with the east side of a remarkable hollow in Düsternbrook Wood;* and at night a small light which stands 33 feet above the sea, on the ramparts of the fortress, will warn you off the reef, which is easily avoided, the opposite woody shore being bold. When past the fortress, keep mid-channel in the fiord towards the town of Kiel, there being plenty of water for ships of any size.

Friedrichsort Light.

Slesvig Holstein Canal.

787. At Holtenau the Slesvig Holstein canal falls into this fiord; it is deep enough to admit vessels drawing 9 feet, and the locks will take in vessels 94 feet long and 25 feet† beam. Its entrance is indicated by two pillars, one in the fiord and the other on shore, at the north side of the canal.

The fiord is perfectly clear, even beyond the town of Kiel, where there are 16 feet alongside the quays, and has in all parts of it good anchorage for any number of ships of any size. The town carries on a brisk trade, possesses much shipping, builds many vessels, and offers all sorts of resources and abundance of excellent provisions to strangers. A railroad connects it with Glückstadt and Altona on the Elbe, and from thence with all Germany, Belgium, and France. Fires and candles are allowed on board vessels in the harbour.

Kiel Harbour.

Schwentine River.

788. The river of Schwentine admits only vessels drawing 5 feet, nevertheless some larger vessels were formerly built at Neumühlen.

Pilots.

At Bülk lighthouse, as also on the opposite shore, there are branch pilots, who attend when the signal is made, and take vessels up the fiord.

Holstein Shore.

789. The shore of Holstein to the eastward of Kiel Fiord has all along it broad shallows, but they are so gradual that they may be approached by the lead; they are widest near the mouth of the fiord, and diminish to the eastward until within 2 or 3 miles

* View 44. † English feet.

of Lippe Point, where the bank again swells out three-quarters of a mile from the shore. At Lippe Point begins the bay of Hohwacht, to the shore of which, along with that we have just described, the name of Colberger Heide was formerly given, and it embraced the whole interval of coast between Femern Island and Kiel Fiord, along which there is no harbour whatever. The district of Vagrien is however very fertile, and as a shipping place was much wanted, one has been formed at Hohwacht, which gives its name to the whole of that wide bay. *Lippe Point.* *Colberger Heide.* *Vagrien District.*

About 4 miles off the shore of Colberger Heide, lies Gabels Flat; on which there are less than 6 fathoms, with a depth of 8 to 9 fathoms between it and the shore. *Gabels Flat.*

The anchorage is good with all winds from N.W. by W. round by the southward to S.E. by E.; but northerly and easterly winds produce a rough sea, and vessels must therefore get away in time, for if it should blow hard it would be impossible to beat out of this deep bay. The best anchorage is in 3 or 4 fathoms water, between 2½ and 3 cables' lengths from the shore, on a bottom of fine sand. *Hohwacht Road.*

When standing in for this anchorage, a rocky ledge must be avoided which juts out to the eastward from a cliff to the northward of Hohwacht, but the depth of 4 fathoms will be found half a mile from the shore. To the northward of the cliff, towards Lippe Point, this same depth is three-quarters of a mile off shore, but there the shallow is gradual, and may be approached by the lead.

The depth in Hohwacht Bay is from 7 to 9 fathoms, generally mud, but off Weissenhaus a sand flat extends to the N.W. nearly a mile, but with not less than 3 fathoms water beyond the distance of 2 cables' lengths from the beach. *Weissenhaus.*

790. The channel between the shore of Holstein and the island of Femern is called Femern Sound, and is of much importance to navigation, though it can admit large ships into its western opening only, for to the eastward it is crossed by a bar with only 11 feet water. *Femern Sound.*

The western side of Femern, all along from Krumstiert Spit to Markelsdorf Point, is surrounded by an extensive flat, called Flügge Sand, the 4-fathoms boundary of which is 6 miles to the westward of Flügge Point. The bottom is gravel, and inclines gradually up to one fathom depth at 2 long cables' *Flügge Sand.*

lengths from the shore, so that the Sound may be approached by the lead; but off Markelsdorf no vessel ought to stand within 4 fathoms, as the flat there is not only much narrower, but interspersed with rocks.

791. Flügge Sand affords an excellent anchorage, in 2 or 3 fathoms, to all vessels with easterly winds; but farther out, where large ships are obliged to ride, the holding-ground is not good, consisting of shingle, gravel, and coarse sand; whereas on the southern moiety of the flat it is fine sand within the depth of 15 feet. Inside the peninsula of Flügge, a narrow and rather winding inlet with 6½ to 7 feet water, leads to some mooring posts to the eastward of Flügge Wood. In the Sound the depth is 5 to 7 fathoms, with fine gray sand, but near the shore of Holstein, sleek with gradually shoaling water; the shallows therefore on either side of the channel may be approached by the lead without having any recourse to marks, as there are no good ones to be found. Avendorf mill, however, well open S. of the south end of the village of Albertsdorf leads to the southward of Flügge Sand, in 2 to 3 fathoms, if it be the intention to seek an anchorage off Femern; but the leading mark through the Sound, midchannel, is, to keep a barn to the southward of Berg mill just in one with the ferryhouse on Femern. This mark, however, leads directly to one of the prongs of the rocky shoal of Strukamp, on which there are but 2 fathoms water, and therefore, if the vessel requires greater depth she must be kept more to the southward, by not following the last mark farther than, at the utmost, until the easternmost trees in the village Sulsdorf are visible to the westward of Orth Point, which is the mark to pass to the westward of Strukamp Shoal. In making Femern Sound from the westward, the deepest water on the bar, 19 feet, will be had, by keeping Berg mill nearly in one with the south side of the ferry-house; which mark leads to the southward of Strukamp Shoal; and when Goldt cliff is concealed by Strukamp Point, the rocky shoal is cleared, and you may stand for the anchorage by keeping along the Femern shore at 2 or 1¼ cables' lengths distance. Between Strukamp Shoal and Grossenbrode Shoal, which extends fron the opposite shore of Holstein, commences the narrow part of the Sound, the leading mark for which is Staber Huk, or the south-eastern point of Femern, just open to the southward of the point near Berg mill. To the westward

Strukamp Shoal.

Grossenbrode Shoal.

Staber Huk.

of this narrow part of the Sound, on the Holstein side, lie the road and harbour of Heiligenhafen, and along the Femern shore the roads of Orth, Lemkenhafen, and Goldt.

792. Just off Heiligenhafen Road lies the large flat of Heilig, the shoalest part of which carries 16 feet, so that all vessels of a less draught may enter it without difficulty, and even frigates will find there from 6 to 4 fathoms by taking the narrow inlet, which has a depth of 3½ fathoms, between Heilig Flat and Grossenbrode Shoal. In entering this road, a vessel has to avoid to the westward a sandy tongue projecting from the Varder, a large holm that lies in front of Heiligenhafen, and to the eastward Grossenbrode Shoal. She will pass to the northward of the tongue by keeping two hillocks, visible to the southward of Grossenbrode church, well open to the southward of the church, or the point near Berg mill well open of Papenort Point; and she will clear Grossenbrode Shoal by keeping a small offing between the westernmost house in the village of Petersdorf (on Femern) and the easternmost house in Orth. It is mentioned above, that to pass to the northward of Grossenbrode Shoal Staber Huk is to be kept just in sight to the southward of the point near Berg mill; but to pass it to the westward, the westernmost hill, situated some distance inland behind Heiligenhafen, is to show itself a little open to the westward of Heiligenhafen church, and this mark or Petersdorf church in one with the east side of Orth will lead into the deepest water of the road. The anchorage in this road is well sheltered against all winds, and has a sleek bottom, with a depth of 4 fathoms; but small vessels may stand farther in, and bring up in 11 feet water, sand and seaweed, on the following marks: Heiligenhafen church in one with the outer mooring post; and the west end of Flügge Wood open to the eastward of the battery on the east end of Varder Holm. Vessels are there perfectly sheltered, and from thence an inlet marked by piles leads to the small town of Heiligenhafen. This inlet is to be dredged out to a depth of 9 feet, but at present it has only 8 feet, and in some places less. In entering, the piles with white heads are to be kept to port, and the others to starboard. The adjacent country is fertile, but the navigation and trade are but indifferent. Free use of fire and candles is allowed in the harbour, and pilots may be obtained.

Heilig Flat.

Heilig Road.

Varder Holm.

Grossenbrode Shoal.

Heilig Anchorage.

Heiligenhafen Inlet.

Pilots.

793. In the island Femern, inside of the Flügge Sand, the

harbours of Orth and Lemkenhafen are formed by the shallow flats of Krumstiert and Hohen Ground. To pass to the eastward

Orth Road. of Krumstiert Spit, when entering Orth Road, keep Petersdorf church well open to the eastward of Orth, or keep Kopendorf behind the eastern half of Orth; and to clear the Hohen Ground do not borrow more to the eastward than the easternmost trees of Sulsdorf being in one with the west side of Orth. In this road there is good anchorage, with north and easterly winds, on the mark Avendorf mill in one with the north end of Albertsdorf, in 9 to 11 feet water, sleek and clay, and about half a cable's length outside the inlets, which are marked by sticks; but the best anchorage is in 14 feet water, with the easternmost house at Orth in one with the westernmost house at Kopendorf.

Orth Harbour. From thence you may proceed to Orth, with vessels drawing 7½ feet by bringing Petersdorf church in one with the westernmost chimney of Orth, which is the leading mark for the mid-channel; and leaving to the eastward the two beacons with straw on the top of the sticks that stand on the west side of a small patch of rocks, with one fathom water; and leaving on the western side two beacons with brooms, which stand in 8 feet water, on the edge of the shore shallow,—you may then come to an anchor in 9 to 11 feet water, half a cable's length to the eastward of the innermost broom.

Lemkenhafen Harbour. 794. Lemkenhafen may be entered with vessels drawing 8½ feet, by keeping close to the northward of a broom beacon standing in the road, somewhat nearer to Orth than to Lemkenhafen; then steering E.S.E. so as to bring Lemkenhafen mill in one with the second westernmost chimney in the village of Lemkenhafen, and Petersdorf church in one with the easternmost trees in Gollendorf; and there anchor in 9 to 10 feet, bluish clay and

Wreck. sand. Outside the entrance attention must be paid to avoid a wreck near the inlet, which is marked by a broom beacon, and on which there are but 3 feet water.

Goldt Harbour. 795. The harbour of Goldt only admits vessels drawing 7 feet, and to enter it is necessary to pass between the south end of the Hohen Ground and the north side of Strukamp Shoal, which is effected by keeping a whitewashed stone, on the beach to the southward of Goldt in one with the village Blieschendorf until Petersdorf church is in one with the small island outside Lemkenhafen; then proceed on this mark, and bring up in 9 or 10

feet water abreast of the yellow cliff to the southward of Goldt; minding to have Petersdorf church just hidden by the west end of Varder, to avoid a spit extending from the Hohen Ground. There is a channel leading to Goldt across the Hohen Ground in not less than 6 feet water, with Avendorf mill in one with the southernmost house at Albertsdorf.

These marks, however, are somewhat difficult to distinguish, and if no pilot can be had at Goldt, no stranger ought to venture in, though this harbour, like those of Orth and Lemkenhafen, is perfectly safe in all weathers.

796. Strukamp and Grossenbrode shoals are connected by a bar, with 16 feet water, which limits the navigation of the Sound from the westward to a corresponding draught; the depth in the Sound farther to the eastward is irregular, but everywhere greater than that on the bar. The mark before mentioned (Art. 791), Staber Huk, just open south of the point near Berg mill, leads mid-channel to the best anchorage in 4½ fathoms, bottom bluish clay, with Landkirchen church in one with the ferry-house on Femern. Off this house there is a good pier, with 2½ to 3 feet water; and a similar one on the opposite shore of Holstein. The holding-ground in the Sound is remarkably good, so that vessels ride there in perfect safety, though the sea in a N.W. gale may be rather rough. Working in from the westward, the ferry-house in Femern may, on the one tack, be brought in one with Berg mill, and on the other, in one with a single tree bearing E.N.E. from the ferry-house, without getting less than 14 feet water. *Femern Sound, W. Entrance.* *Ferry Pier.*

797. We are now going to describe the more difficult entrance from the eastward into Femern Sound.

If coming from the southward, and intending to run through Femern Sound, attention must be paid to avoid a rocky neck, with one fathom water, extending from the east point of Holstein; do not therefore approach this shore nearer than Burg church being in one with the east end of the bushes close to the eastward of Berg mill. This latter course is to be followed until Strukamp Point is in one with the middle of Flügge Wood,* which is the leading mark into the Sound across the bar between two beacons, the one on the west side carrying a cross, and the other on the east side, a basket ball; on the bar 11 feet water *Femern Sound, E. Entrance.*

* View G on the Chart of Kiel Bay, Sheet 4.

will be found, over rocky ground. Some of its rocks have been removed, but there are more to be taken away. In this channel there are several beacons—three carrying brooms, to be left to the eastward, as they are placed on the southern edge of the rocky ledge called the Middel Ground, with only 4 feet water; and farther in, a straw beacon, which stands on the north-east spit of the Holstein shallow in 6 feet, and is therefore to be left to the southward. The above-mentioned leading mark, Strukamp Point in one with Flügge Wood, is to be followed until reaching the mark for the anchorage in the Sound; or if the intention be to pass through the Sound, then continue on that mark until Berg mill is in one with the south side of the ferry-house, and this new mark will lead out to the westward. In working through the narrow eastern part of the Sound, the point of Strukamp may be run on with each side of Flügge Wood; and when abreast of the 2nd and 3rd brooms, in standing towards the south side of the channel, the wood may be run even half of its breadth to the westward of the point, but then the depth will suddenly decrease.

Middel Ground.

Working Marks.

When working through the Sound, it is necessary to tack off the Middel Ground before the south end of Flügge Wood is hidden behind Strukamp Point, and on the other side to tack before the north end of Flügge Wood comes outside of Strukamp Point; and these marks are to be followed until inside of the three broom beacons, or, until Avendorf mill is just to the westward of a single tree (with a lofty head) standing to the eastward of the ferry-house, the Middel Ground being then passed, and the shore of Femern open to your approach. After having passed the ferry-house, attend to the following marks: Berg mill in one with the ferry-house leads clear of the shallows off Femern, and also off Strukamp Shoal; and Staber Huk, just open to the southward of the point at Berg, will carry you to the northward of the Holstein Shallow, and likewise of Grossenbrode Shoal.

Grönne Vold. 798. The large shallow flat called the Grönne Vold is a part of the Middel Ground, but carries only 4½ to 7 feet water, and separates the Sound from Burg Tiefe, an inlet in the shallows outside. You pass to the southward and westward of Grönne Vold by following the above marks for the entrance to the Sound; but to pass it to the eastward, keep Burg church in one with the east side of the Staacken, two single houses with red tile roofs, standing on the beach in the broad bay between Berg mill

and the pilot-houses at Burg Tiefe. To this roadstead you may come by following this last mark, and by using your lead, anchoring in 15 feet water, on sleek and seaweed, with the pilot-houses bearing N. by E. ½ E., or, in 3 fathoms, with Burg church in one with the middle of Tiefe, and Papenort touching the point off Berg mill. It will be found a good berth with the winds from E. round by N.W. to S.S.W.; and the pilots there take vessels through the Sound. From thence much corn is exported, and the roadstead is frequently used as a stopping-place. *Burg Tiefe.* *Pilots.*

799. From Femern Sound* you may coast along shore by the lead to Staber Huk, where there is a reef consisting of large rocks, but extending only 3 cables' lengths from the Point; it ought not however to be approached within half a mile, at which offing there are 4 or 5 fathoms over sand. The south side of the island, between Burg Tiefe and Staber Huk, offers good shelter against northerly winds, but the bottom, near the shore, is rather rocky and rough, and the anchorage is but indifferent for vessels with hemp cables, they will therefore prefer Burg Tiefe; and large vessels, if too deep for that road, may anchor outside in 6 fathoms, where the holding-ground is good, though not nearer to Grönne Vold than with Burg church open to the eastward of Glambek mill. *Staber Huk.*

800. The eastern side of Femern, from Staber Huk to Catherine Hof and Ohlenburg Huk, is perfectly clean, with a gradually shoaling bank along the shore; but from Puttgarden Point a dangerous spit of sand projects a mile from the shore; its eastern side rises steeply from 6 fathoms to one, and may not be approached by the lead. The two high points of Catherine Hof and Ohlenburg in one will lead far outside that spit; and on this mark you are abreast of it when Bannersdorf church is in one with the middle of the village of Puttgarden. Coming from the westward there is no mark for the spit, but on that side the lead will lead up to it safely. *Puttgarden Reef.*

At the north-eastern extremity of the spit there is a floating beacon, with a red pole and two brooms, in 5½ fathoms water, but the safest guide is the Revolving light on Ohlenburg Point, called Marien Leuchte; it is 94 feet high, and exhibits a bright light every half minute, lasting about 10 seconds, and is visible in all directions, except between N. ½ W. and S. by E. ½ E., *Beacon.* *Ohlenburg, or Marien Light.*

* See Chart of the Baltic, Sheet I.

Presen Bight. where it is hidden by the shore. In Presen Bight, to the southward of the light, there is a good anchorage with the wind from S S.W. to W.N.W.; but with easterly and southerly winds vessels must run for that purpose to the flat lying to the northward of Markeldorf Point, remembering withal, that to the westward of the point the bottom is foul within the depth of 4 fathoms.

Markeldorf Flat.

801. From Femern Sound farther southward, to the village of Dame, the Holstein shore is clean, with gradual soundings, and the 4 fathoms line in general not more than 7 cables' lengths distant, except off Siggenerbusch, the only woody point on this part of the coast, and there the shallow is double that breadth.

Dames Head. 802. Dames Head, the S.E. angle of Holstein, is a conspicuous point of moderate height, off which, in an E.S.E. direction, there is a reef of half a cable in length, the mark for the shoalest spot of which is some tall trees standing to the northward of a blue-tiled house of the Controller just in one with that house. To clear all the rocks inside of the 3-fathoms line, keep the trees in one with the east side of the houses. The 4-fathoms line is about 8 cables' lengths off; and at the distance of a mile from the shore the depth is 6 fathoms. On its northern side the shoal is steep, with 5 fathoms, close to, and therefore in dark or foggy weather vessels should be on their guard when coasting along by their leads.

803. To the southward of Dames Head, which forms the north side of Neustadt Bay, the shallow is clean and gradual as far as Pelzer Point; here the shallow must be carefully avoided, for though it extends only a quarter of a mile it is very steep.

Pelzer Point.

804. In Neustadt Bay, to the westward of a line from Staber Huk to Buch Point, there are everywhere from 10 to 13 fathoms, with clay, mud, and sleek bottom close up to the shallow ground; and in one direction, from 2 miles outside Klütz Head to the open sea there are as much as 14 fathoms. Off the Holstein shore, however, there are two shoals, the Sagas Flat and the Valkyrien Knob.

Sagas Flat. 805. The Sagas Flat lies close to the eastward of a line from Staber Huk to Dames Head, at the distance of 5 miles from the latter, and 3 miles from the land near Siggenerbusch. The flat is 2 miles across in all directions, with 4 to 5 fathoms, muddy bottom; nevertheless, there are two rocky patches with 3¼ to 4 fathoms to be avoided by large vessels. Between the flat and the

shore shallow there is a channel with 6 to 7 fathoms, but we have no marks for it. The flat slopes everywhere gradually, and will serve as a guide in thick weather to ships which are bound to Neustadt, or Trave, and which may have been effected by the current.

806. The Valkyrien Knob lies 3 miles from the land between Dames Head and Pelzer Point, and consists of a small rocky patch with 23 feet water, surrounded by a flat of rocks and gravel extending E. and W. 5 to 6 cables' lengths, and N. and S. 2 cables' lengths, from which it deepens suddenly to 11 and 12 fathoms clay and mud bottom. From its shoalest part Dames Head bears N.E. ½ N., and Pelzer lighthouse W. ½ N. *Valkyrien Knob.*

807. The bay west of Pelzer Point is divided into the outer and the inner road of Neustadt, and both have excellent holding-ground, and are quite safe, as the S. E. winds, to which they are open, blow from the shore of Mecklenburg, which is only 8 miles distant.* The outer road admits ships of any size; and the inner road, which is formed by a flat extending from the western shore, may be entered by keeping a tower on the high hill of Gömsberg in one with the eastern part of the village of Roge. The best anchorage in this road is in 4 fathoms, when Neustadt church just opens from behind a hill, with a demolished battery. Another mark to pass outside Pelzer Point in 8 fathoms is, to keep Grömitz church open of the wood to the westward of it. Ponstorf mill nearly in one with a steep yellowish cliff on the western shore, leads to the southward of Pelzer Point. The north-eastern shallow is marked by two beacons with brooms, and the western shallow with one beacon with a broom. *Neustadt Roads.*

As the inner road has only a depth of 4 fathoms, it is not fit for ships of the line, not leaving sufficient water for them to pass over their anchors; but all other vessels may bring up in convenient depths. The shallow on the north-east side is marked by beacons in 3 fathoms, and maintained by the pilots in Neustadt, whose business it is to take vessels into the harbour, but they were so tardy in coming out, on account of the long inlet, that they are now stationed at Pelzer Point, where an indifferent boat-harbour, with about 4 feet water, has been constructed for their use. *Pilots.*

808. On Pelzer Point there is a Revolving Light, exhibiting a *Pelzer Revolving Light.*

* See Plan of Neustadt and Travemünde.

bright flash every two minutes, but darkened for a short time before and after it, and showing a steady fixed light during the rest of that period. The light is 47 feet above the sea, and it may be well seen 10 miles off. The lighthouse is whitewashed, and is a good mark in daylight.

Neustadt Harbour. 809. Neustadt harbour is the outlet of an inland sheet of water, so that it has the form of a river; and all the way from the sea to the town there are mooring-piles for making fast to, or warping. It has been lately much improved by dredging, and by the removal of a range of old piles which formerly barred the entrance. The depth in the harbour is at present 14 feet, and outside of all the piles there are two buoys in 15 feet water, one at each side of the channel. The bottom, outside, is mud mixed with sand, so that vessels would not be greatly injured by grounding there.

Supplies. Formerly, many vessels were built at Neustadt, and there are still ship-yards where repairs can be effected. Excellent provisions may be had, and, from the fertility of the neighbourhood, navigation and trade are in a flourishing state.

Niendorf Flat. 810. To the southward of Neustadt, from Haffkrug to Niendorf, the shore, though very low, is uncommonly steep; but from Niendorf round the next point as far as the mouth of the river Trave the shallow increases in breadth, and a flat of several miles in length projects towards the N. E.; on which, though the water is deep, the ground is so foul that it is imprudent to anchor. The *Spit Buoy.* extremity of the spit is marked by a white buoy, in 12 fathoms.

811. Between this foul flat and the clean sloping shores of Mecklenburg, the water shoalens gradually from 12 fathoms *Trave River.* towards the mouth of the river Trave, the bar of which is a sandy flat, across which great pains are taken to keep open a channel of 11 or 12 feet in depth, by constant dredging, but N. E. gales frequently shut it up.

Buoys. The inlet is marked by a red buoy outside the bar, and farther in there are three black buoys along the north side of the channel, and three white buoys on the south side. On the north point of *Trave Light.* the river there is a Fixed Light, elevated 115 feet above the sea, and visible 10 or 12 miles; but so screened that by losing sight of it you are sure of being too near to either one or the other shore. The road outside the bar has good holding-ground, but is entirely exposed to north-easterly winds, from which there is no escape.

812. Travemünde is a small but fortified town, and a much frequented bathing-place. Vessels not too deep to cross the bar may lie alongside the pier at Travemünde; but up the narrow and winding river, to the city of Lübeck, there is only sufficient depth for vessels drawing 7½ feet; nor is there more now, at Königsfähre, which was formerly the man-of-war harbour of Lübeck. The navigation up the shallow and sinuous Trave is very troublesome as well as tedious, for the stream always runs out. *Travemünde.* *Lübeck.*

The prosperity of Travemünde is controlled by the vicinity and supremacy of Lübeck, at which place vessels can procure all the supplies that are wanting at Travemünde, where neither warehouses nor ship-yards are to be found, and where even the lighter business on the river is carried on by a monopolized corporation in Lübeck. From the river Trave a lively trade is carried on with all the ports in the Baltic, and a regular communication by steam vessels is established with Copenhagen, Stockholm, Riga, and Kronstadt. *Supplies.*

Travemünde, however, supplies pilots for the bar, and for the river up to Lübeck. *Pilots.*

813. From Travemünde Road, and eastward past Klütz Point to Klütz Head, the shore of Mecklenburg is clean everywhere, with gradual shallows. *Klütz Head.*

814. To the eastward of Klütz Head lies the large bay of Wismar and the island of Poel,* which forms and shelters the harbour. The western shore of the bay, between Klütz Head and Tarnewitz Point, is bold, the shallow only extending 1 to 3 cables' lengths, with a general depth of 6 to 8 fathoms over a bottom of sleek and sand, and affording good anchorage with southerly winds. But from Tarnewitz Point a neck of sand called the Lips extends more than 2 miles in the form of a crescent, carrying less than 6 feet water, and at its eastern extremity rising up to a dry narrow ridge of sand, two-thirds of a mile long. *Wismar Bay.* *Lips Flat.*

815. A sandy flat connects the Lips with another large flat called the Hannibal to the north-eastward, but less shallow, as it has everywhere from 8 to 12 feet water. It is about 1¼ miles in breadth, and 1½ miles from east to west, and consists of white sand, with some spots of seaweed and rocks. Sloping flats *Hannibal Flat.*

* See Plan of Wismar Bay.

stretch far out from this shoal, while its inner side, facing the bay, is very steep. On the S.E. side of the Hannibal, in the depth of 5 fathoms there is a buoy painted with black and white rings, the bearings from which are, Poel church S.S.E. ½ E.; Klütz Head W.N.W. ½ W.; Prosken church S.S.W.; and Hohen Kirchen S.W. ½ S.

Wustrow Flat.

816. The north end of Wustrow peninsula is bold, but along its western side a sand flat, carrying a few rocks, projects in an angular form 2 miles west, with a less depth than 3 fathoms, and gradually decreasing towards the shore. These three shoals, the Lips, the Hannibal, and the Wustrow Flat, though they form a bar in front of Wismar Bay, yet afford between them two good entrances, *viz.*, the eastern, or Main Deep (Grosse Tiefe), between the Wustrow and the Hannibal; and the western, or Middle Deep (Mittel Tiefe), between the Hannibal and the Lips.

Jakelberg Reef.

817. Farther in lie Jakelberg and Tonnenhacken reefs, and four insulated patches, the Schweinsköthel, the Secher Ground, the Mittel Ground, and the Plade. Jakelberg Reef stretches out far to the northward from Poel Island, the depth of 4 fathoms, being nearly 2 miles from the shore. The east side of the reef is steep-to, but the lead will lead up to the west side, on which, at a mile from the island, there is a red buoy in 17 feet water, and on the following marks: Wismar high steeple in one with the mill on Poel, and the pilot-house on Poel in one with the east side of Hohen Wischendorf Wood. To the southward of this buoy, the shallow along Poel becomes narrower till within a mile of the pilot-house, where it suddenly widens to 8 cables' lengths, and forms the long reef of Tonnenhacken. Off the spit of this reef there is a small patch, with 17 feet water, marked by a beacon with a red basket, on the line of Poel mill and church in one. The reef consists of sand with large rocks, shoaling quickly up from both sides to 2 feet water.

Tonnenhacken Reef.

Plade Shoal.

818. Tonnenhacken Reef is connected by a 2-fathoms flat to the Plade, on which there are only 10 to 12 feet water for the extent of 5 cables' lengths. On its south side, in 2 fathoms, there is a pole in the ground carrying a white basket, immediately to the eastward of which the water deepens suddenly, whereas on the other side of the shoal it gradually shoals.

Beacon.

Mittel Ground.

819. Inside of the Plade lies the Mittel Ground, being about half the size of the Plade, with 14 feet on its shoalest part, near

the centre; and between the Plade and the Lips, the Schweins-köthel, with a length E. and W. of more than 4 cables' lengths, and a depth of 11 to 12 feet, but quickly increasing to 4 fathoms, inside of which it is not safe to depend upon the lead. *Schweins-köthel.*

820. To the southward of the last-named shoal, and only separated from it by a narrow channel, lies the Secher Ground, with 14 feet on its shoalest part. *Secher Ground.*

821. Several beacons and buoys mark the various channels between these shoals. Two beacons stand on Poel Island, though they are rather small for that purpose: a white buoy on the east end of the Hannibal and the red buoy on Jakelberg Reef serve for the Main Deep; a black and white buoy at the S.E. spit of the Hannibal, as mentioned above, and a black buoy midchannel in 17 feet water lie in the Middle Deep; there are also the two basket beacons on poles, as already stated, one red, on the patch outside of Tonnenhacken Reef, and the other on the south-eastern spit of the Plade. Besides which a red floating beacon with a basket lies on the north-west side of the Plade, in 16 feet water; another red floating beacon with a basket, on the west side of Poel Island, in 14 feet water; and a white floating beacon with a white basket on the east side of the rocky shoal stretching out from the Lips, in 15 feet water. *Channel between the Shoals.*

When entering from the eastward, through the Main Deep, the buoy with black and white rings, as well as all the white marks, are to be kept to the northward, or to starboard, and all the red ones on the port side. Coming from the northward, through the Middle Deep, the same rule is to be observed after having passed the black buoy.

All the buoys and beacons are taken in about Christmas, and are replaced early in April.

822. Though the above system of buoys and beacons affords ample means for entering the Port of Wismar, we still advise every one not familiar with the place to take a pilot. The pilots live on the west side of Poel, and though perhaps they are rather tardy when the wind is northerly, owing to the indifference of the boats, one of them will be sure to attend when the signal is made. *Pilots.*

823. The Main Deep admits ships of all sizes; but those that draw 4 fathoms must not keep more to the westward than Poel mill coming in one with Wismar highest church steeple, which leads to Jakelberg red buoy. Proceed in this direction, or rather *Main Deep.*

a little more easterly, until Dreves-Kirchen bears S.S.E. ½ E., when you will be in 6 or 7 fathoms water, and at the same time you will see both buoys, the course between which is S.W. by W. ½ W. In general the pilot is waiting there, but if northerly winds prevent his getting out, we advise strangers to anchor inside the buoys in 6 or 7 fathoms, where they will find good holding-ground.

Hannibal Flat.

824. Vessels drawing less water may keep more to the westward, and stand across the Hannibal Flat without having less than 20 feet water, if they do not bring Poel church to the eastward of Poel Wood. Take notice that the church is at the same time in one with Wismar high steeple. This mark leads between the buoys, and from thence steer S.W. by W. ½ W. until the small N.W. beacon on Poel is in one with Poel church, when the course may be altered to W.N.W. ½ W. through the Kracken Deep, and to the southward of the Hannibal, where the holding-ground, in 5 or 6 fathoms, is good, and where you may, under any circumstances, bring up and wait for the pilot.

Working Marks.

Working in, and having passed the Hannibal buoy, it will be necessary to tack when Hohen Kirchen is nearly in one with the east side of Wischendorf Wood, on the projecting point to the northward of Bekerwitz, and you should continue on this mark until Dreves-Kirchen opens to the southward of Poel Wood.* Standing towards Jakelberg, you must tack when the pilot-house on Poel is just open to the eastward of Wischendorf Wood, which mark serves until Poel mill opens to the southward of Poel Wood.† The shallow then extends farther out, but it may be approached by the lead to 4 fathoms, whereas the south-east side of the Hannibal is nearly steep-to, from 5 fathoms to 10 feet water.

Middle Deep.

825. The black buoy on the bar of the Middle Deep is made by keeping the S.W. beacon on Poel in one with Wismar low steeple; but if the beacon should not be visible, the pilot-houses on Poel are to be kept a little open to the southward of Timmensdorf, a village half a mile S.E. of them. In working in, it is to be observed that the flat, with a depth of less than 3 fathoms, is only 3 cables' lengths across; and that for 3 cables' lengths to the westward, and for 2 cables' lengths to the eastward of the buoy, 15 feet water may be preserved, thus giving

* View 45. † View 46.

half a mile on each tack, the length of which will increase as you approach the Kracken Deep, inside of the flat; and even when there you should not stand nearer to either the Lips, the Hannibal, the Schweinsköthel, or the Plade, than into 4 fathoms water. But before giving directions for the Kracken Deep, we shall describe the interior of Wismar Bay. *Kracken Deep.*

826. Inside the Lips, the points of Tarnewitz and Wischendorf form Wohlenberg Bay, which is an excellent harbour, well sheltered from the sea by the Lips, with an even depth of 4½ to 5½ fathoms, and a shallow not wider than 2 or 3 cables' lengths within the depth of 4 fathoms, except in one place, near the little tile-roofed house of Sandkrug, on the south side of the bay, where it runs off 7 cables' lengths. The bottom on the shallow is in general sand, but in some places soft clay, forming excellent holding-ground. *Wohlenberg Bay.*

827. Off Wischendorf Point, which forms the eastern side of Wohlenberg Bay, a sandy spit with several rocks, of which those nearest the shore are dry, extends 8 cables' lengths towards the N.N.E. within the depth of 4 fathoms; and off the end of the reef, in the direction of the Mittel Ground, there are two small patches, the westernmost with 22 feet, and the eastern one with 19 feet water. *Wischendorf Spit.*

Between the points of Wischendorf and Fliemsdorf is the Zirow Bight, with a very wide shallow along the shore. *Zirow Bight.*

The point of Fliemsdorf is rendered conspicuous by a couple of single low trees standing to the northward of a clump of trees on the point; and off this point there is a ledge of sand and rocks, with only 9 feet water, and which ought therefore to be marked by beacons, being more than a mile from Fliemsdorf Point. The eastern side of the ledge is marked by two brooms, on white poles, standing in 16 feet water. *Fliemsdorf Point and Reef.*

828. Hvalfisk is a small island, where formerly stood a fort, but now, on a mound at its north end, a beacon; which, with a red pole and broom, on the edge of the shoal 280 fathoms W.S.W. of that beacon, together with the before-mentioned two brooms on white poles, indicate the channel up to Wismar. From the north side of Hvalfisk a shallow reef with some large rocks projects towards the south end of Poel. Between the spit of this reef and the shallow from the south side of the island, there is a kind of inlet 1¾ cables' lengths wide, with 4 to 3 fathoms in the exterior part, and 3 to 2 fathoms farther in. *Hvalfisk Beacon and Marks.*

Poel Sound. 829. Poel Sound penetrates in a northerly direction more than 2 miles into the island itself, its breadth being about 4 cables' lengths, and its depth 6 to 8 feet; within 3½ cables' lengths from the church there are only 3 feet.

Kracken Deep. Having entered the Kracken Deep, proceed till the whole town of Wismar is visible outside of the low south-west point of Poel, and on this mark steer directly for Fliemsdorf trees, which ought to be seen just to the westward of the church of Wismar, which has no steeple. This mark leads between the Plade and the Mittel Ground, and should be followed until Hohen Kirchen is in one with the eastern side of Wischendorf Wood, and then steer S. ¼ E. until the S.W. beacon on Poel bears E.N.E. On that cross-bearing the 4 fathoms part of the bay terminates, but small vessels may continue towards Wismar by steering for the beacon on Hvalfisk, and by the free use of the lead, giving a sufficient berth to the reefs off the Fliemsdorf shore. In passing between Fliemsdorf Point and Hvalfisk, the two brooms on white poles must be left to the westward, and the one broom on the red pole to the eastward. In this channnel 13 to 14 feet water will be found, and will be carried to some distance inside

Kesselhard. of Hvalfisk, till approaching the Kesselhard, a tongue of sand which projects to the northward from Grasort Point and, separating the two parts of the bay, rises in one place to within 4 feet of the surface.

Wismar Road. In Wismar Road, to the southward of Hvalfisk, the bottom is everywhere sleek, with much seaweed, which in some places floats on the water; the anchors, however, take good hold of the ground if plenty of cable is given to allow them time to sink through the weed.

Wismar Harbour. 830. Wismar Harbour is formed by two ranges of piles, between which the depth is but 9 feet, and that is maintained only by dredging; but inside of the piles, between them and the shore, on both sides, it is nearly dry. The tops of the two exterior piles are shaped like the head of a man, and the opening of the inlet is pointed out by a black stake, standing in 10 feet water, N. by W. ½ W., distant 1¾ miles from Wismar high steeple.

Flag Deep. 831. A shorter way to Wismar, when coming in by the Main Deep, and preferable with easterly winds, is through the Flag Deep, between Poel Island and the Plade Shoal, where the depth

with a common waterstand is not less than 15 feet. To take this channel, pass close on either side of the red basket beacon, standing in 17 feet water on the patch outside of Tonnenhacken; and then steer so as to leave the white basket beacon on the S.E. spit of the Plade to the eastward, but not too close. If the beacons are removed it should be known that the place of the red basket is with Poel church and mill in one, and Hohen Kirchen just in one with the middle of Wischendorf Wood, and therefore Wendorf Barn kept just open to the southward of the low south-west point of Poel will clear it until Hohen Kirchen draws near the east side of Wischendorf Wood; then haul a little to the westward, along the shallow off Poel towards Hvalfisk.

832. If coming in through the Middle Deep with a westerly wind, and wishing to keep well to windward, a narrow channel will be found between the Lips and Schweinsköthel shoals, with a depth of 20 feet; the leading mark for which is the church steeple of Beidendorf in one with Wischendorf Wood, between the middle of the wood and its west side, until the vessel has nearly reached the S.E. end of the Lips; then haul over a little more westerly towards it until the barn of Wischendorf is in one with the bushes to the westward of the wood. On this last mark steer across the flat until the S.E. point of the Lips bears W.N.W. ½ W., when you may direct your course either towards Wismar or into Wohlenberg Bay. If bound to the former, particular attention should be paid to avoid the spit of Wischendorf Point, which ought not to be approached nearer than the cross mark of Horndorf church drawing near to the north end of Hvalfisk, for when these objects are in one, the depth on the end of the spit is only 14 feet: or you may, if convenient, take the channel between Schweinsköthel and the Secher Ground, by steering E.S.E. ½ E. for Poel church; but remembering that though it has 4 fathoms depth, it is only a cable's length wide. *Lips Deep.*

833. The excellent anchorage in Wohlenberg Bay may be entered from the Kracken Deep by keeping Hohen Kirchen well open to the westward of the western cliff on Wischendorf Point, which leaves the Plade and the Mittel Ground to the S.E., and Schweinsköthel and the Sechers Ground to the N.W., and after having passed the Lips you may stand into the bay and anchor in a convenient depth. *Wohlenberg Bay.*

Poel Channel. 834. The long channel that separates Poel Island from the eastern shore is so shallow as only to admit small boats, and so narrow that a drawbridge has been thrown across. But the *Salz Haff.* inlet of Salz Haff, between the peninsula of Wustrow and the main, 5 miles deep, and leaving an inlet midchannel, has a hole with 2 to 4 fathoms at its lower end, and carries 10 to 6 feet water as far up as to Alten Garz church, 5 miles from its entrance; but that entrance between the S.W. point of Wustrow and the small island of Werder is crossed by a bar with only 8 to 10 feet water; this bay or creek may, however, often prove to be a useful refuge for small craft.

Buch Point. 835. Buch Point is the north-west angle of Mecklenburg; between it and Wustrow, the shallow, from 4 fathoms is only 2 to 4 *Alten Garz.* cables' lengths wide; and in the small bight at Alten Garz church there is good anchorage in 5 to 6 fathoms, and tolerably good holding-ground, with all winds off shore. Off Buch Point the shallow extends half a mile, and outside of the shallow and separated from it by a passage a third of a mile wide, with 4 to *Trolles Ground.* 5 fathoms water, lies the Trolles Ground, a shoal of sand and some rocks carrying not less than 21 feet water. The north edge of this shoal is 1¼ miles from Buch Point, and all vessels ought to avoid it when there is any swell; on the east side it is steep from the depth of 7 fathoms.

From Buch Point and nearly to the bathing-place of Heiligen, there are only 4 fathoms water 1 to 2 cables' lengths from the *Röde Bay.* shore. Abreast of the bathing-house in Röde Bay, good anchorage may be taken in 4 to 5 fathoms, with winds off shore; but if the wind comes round from seaward you must be off, for the swell rises quickly. From the baths to the cliffs of Stolterau Point the 4 fathoms depth is 3 to 4 cables' lengths off shore, shoaling gradually from seaward, but inside of that depth the bank is steep, and therefore vessels ought not to come too far in during the night. Between Stolterau Point and Warnemünde the coast forms an inconsiderable bay, in which the shallow along the shore is more than a mile wide.

Warnemünde. 836. Warnemünde, at the mouth of the river Warnow, has a harbour formed by two stone piers, of the length of 2 cables, and the space between them 120 feet in breadth, with an average depth of 11 feet, and a current nearly always running out. On each pier head stands a beacon, the western one white, the other

black and white. A lighthouse, which is not very conspicuous, stands 2¼ cables' lengths in from the western pier-head; and the light, which is fixed, is elevated 58 feet above the sea. To indicate the varying depth of the water, a large black and white striped ball is shown on a pole standing near the lighthouse, when the depth in the harbour's mouth is 11 feet, and for every half foot less water, a smaller black ball is hoisted beneath the large one, or, for every half foot more water, it is hoisted above the large one. If there is no stream out, or if the current should be running in, a broad pendant is hoisted on the same pole. Vessels are bound to pay pilotage whether taking a pilot or not, but all foreigners are compelled to have one. When northerly winds prevent the pilots from getting out, the colours are hoisted along with the ball. *Warnemünde Light.* *Signals.* *Pilots.*

837. Vessels drawing more than 10 feet are obliged to anchor in the road outside, and are there entirely exposed to all northerly winds, which immediately produce a rough sea, particularly if from W.N.W., which is the very worst. The holding-ground, however, is good, gravel with clay underneath, so that it rarely happens that vessels provided with sufficient ground-tackle are driven on the shore. The best anchorage is with the lighthouse in one with the harbour's mouth, in 5 to 6 fathoms water; but large ships commonly bring up with the northernmost steeple in Rostok a little to the westward of Warnemünde church. *Warnemünde Road.*

The harbour is easy of access, by steering in between the beacons, and paying due attention to the current, according to the strength of which the sail must be regulated. Along the quays on the eastern side free use of fire and candles is allowed, but not on the western side. If bound farther up the river Warnow, which admits vessels drawing 8 feet, the ballast can be thrown in the appointed place only. A steam tug is stationed at Warnemünde, and farther up the river warping-piles are placed on the east side of the channel, except the 7 last piles near Rostok, which are standing on the south side. The channel is from 160 to 200 feet wide, and the bottom soft everywhere. *Harbour.* *Rostok.*

838. The coast of Mecklenburg and Pommern (Pomerania), from Warnemünde to Dars is perfectly safe, though the shallow between Warnemünde and Wustrow church, the only one on that part of the coast, extends more than 2 miles off to the depth of 4 fathoms, yet it is so gradual that at a distance of 1 mile of *Mecklenburg Coast.*

offing there are 3 fathoms water. Between Wustrow and Dars Point the breadth of the shallow along the shore is 4 to 7 cables' lengths, till approaching that low woody point where it becomes very narrow, although to the eastward of the point it extends far out to the northward.

Dars Point and Lights.

839. On Dars Point there was a stone beacon, shaped like an obelisk; and not very conspicuous from the sea; but in 1848 it was replaced by a lighthouse, showing at the height of 108 feet, a light that revolves once every minute, and visible 16 miles. At the height of 41 feet, in the same tower, there is a second light, which is fixed, and may be seen 11 or 12 miles, but which illuminates at an angle of 40° only, between the bearings of E. ¼ S. and S.E. The tower is painted red.

Plantagenet Shoal.

840. In finishing here the description of the German shore, we shall mention, though not belonging to the part here described, the Plantagenet Shoal; as it is very dangerous to ships of the line, having but 21 feet water on a single ridge, though extending only 20 yards in a north and south direction, and 6 or 7 yards east and west. From this shoal, which is 11 miles from Hiddensee Island, the nearest land, Moen Light bears N. by W. 20 miles, Giedser Light W. ½ N., 10 leagues, and Dornbusch Point, the northern extremity of Hiddensee, S.E. by E. 12 miles. These particulars, and its position, are the result of a minute survey of it in 1837.

CHAPTER IX.

THE SOUTHERN SHORE OF LAALAND.

841. In the sea, to the southward of Langeland and Ærö, there are several detached flats, but all with depths from 5 to 7 fathoms, except Sneedorf Flat,* which has but 23 feet, and, being marked in the chart, will of course be avoided by all large ships. These flats afford convenient stopping-places for those smaller vessels which prefer shallow water, and all but one have sandy bottoms. *Sneedorf Flat.*

842. The bay between Langeland and Ærö is clean, being without any shoals or flats, except the shallow that projects out to 4 fathoms, from Eröshale, or the tail of the south-east point of Ærö. But this bay affords no good anchorage, and it sometimes proves difficult to get out of it with the winds to which it is exposed, and which throw in a heavy sea. In the channel to Marstal, between the islands of Langeland and Ærö, there are but 7½ feet water (Art. 738), but it is marked by beacons, and pilots are ready when the signal is made. The rest of the flat that connects the two islands is so shallow, that it is only in some few places even boats can pass. *Marstal Bay.*

Close to the westward of the south point of Langeland, and on the edge of the shore, the Snekke Ground has but 6 feet water over large rocks: it is too near the shore to be of any moment to large vessels, but small craft should take care of it when coasting close in. The village of Ristinge in one with Daven Point leads outside of these rocks; and a passage with 15 feet water inside of them is marked by the western cliff of Ristinge, kept just inside of Daven Point. *Snekke Ground.* *Mark.*

843. The flat round Gulstav Point is of small extent, but steep from 5 to 4 fathoms, and consists of coarse sand and pebbles. The flat itself is gradual, and may with safety be approached by the lead, according to the draught of the vessel. The Fixed *Gulstav Point.*

* See Entrance to the Baltic, Kiel Bay, Sheet IV.

light exhibited on the high hill of Fakkebierg, a mile to the northward of Gulstav Point, has been already described in Art. 551.

Kiel Bay. In the whole space which is enclosed by Slesvig, Holstein, Langeland, and Femern, and which is called the bay of Kiel, and has a pretty even depth of 9 to 12 fathoms, except on the flat above mentioned; a sandy bottom is found in its shallow parts, and mud in its depths.

844. The passage between Femern and Laaland is called the *Femern Belt.* Femern Belt, and connects the bay of Kiel and the Great Belt with the bay of Neustadt; its deepest water is 15 fathoms near the Femern shore, towards which it rises much more suddenly than along that of Laaland. North of Markeldorf Point 4 miles, *Öiet Bank.* there is a flat called Öiet (the eye), extending 3¼ miles north and south, but only half that distance wide, with 7¾ to 10 fathoms water, over rocks, gravel, and coarse sand. Its north side slopes gradually, but its south part suddenly falls into 19 fathoms, forming a channel a mile wide called Winds Grav, and separating the flat from the shore shallow of Femern, which decreases gradually from 10 fathoms. This flat and deep channel will serve as a guide in thick weather to ascertain a vessel's position.

South Shore of Laaland. 845. Along the very low south coast of Laaland the shallow, at the distance of 1 to 1½ cables' lengths, is steep-to at the 2-fathoms line, but from thence it so gradually deepens, that to the westward of Vester Ness the 4-fathoms line is 1⅛ miles off shore; but to the eastward of that projecting elbow of the sand, the 4-fathoms depth comes within half a mile of the shore as far as the inlet called Kramnisse Gap, when it again enlarges, until *Kramnisse Gap.* off Hyllekrog, and there the shallow is 3 miles wide.* Kramnisse Gap is the only inlet on this part of the coast; it has 7 feet water with a snug little harbour inside; and is the only entrance to Rödby Fiord. South and south-westerly winds occasion too much surf, and with N.N.W. gales the wind is too scant to enter this inlet: this wind also produces a low water. On the other hand, N.E. gales, which bring in a high water, are followed by a hollow swell along the shore; so that favourable circumstances are required to enter Höminde and Tiörnebierg, on the west end of which is the pilot-house. From the S.E. point of Höminde a

* See Chart of The Baltic, Sheet I.

spit of sand projects with 2 to 4 feet water, just abreast of the mouth of the inlet; and the east point of this spit bears W.N.W. from a single house on Tiörnebierg, leaving an inlet only 400 to 600 feet wide, and even this narrow passage is encumbered by a shoal with 5 feet water, which can be passed on either side. To enter this inlet in coming from the westward, keep along shore in 14 feet water, outside of the sandy spit, until the points forming the entrance are in one, then steer N. ¼ W. or N. by W. Inside of the sandy spit there are 8 to 9 feet water, and by keeping close to Tiörnebierg 11 feet, whereas along the point of Höminde the water is very shallow. Close within the point, and 80 feet to the northward of it, stand 4 piles in an E. and W. direction, along the beach, and these form the harbour. Between the piles there are only from 4 to 5 feet water; but between the point and the western piles there is a narrow inlet with 9 to 11 feet, where vessels may fasten to the piles; from the eastern end of which a crooked inlet, with very little water, leads to the southward of Magleholm, and to the northward of Langö up to Næsbek, which is the shipping-place for the little town of Rödby, and at which some loose stones form a sort of a landing-pier. The depth on the flat to the southward of Magleholm, as well as in the vicinity of Næsbek, is only 2½ feet, and therefore practicable only for the boats belonging to Rödby, which load or unload the vessels that remain at Kramnisse. *Inlet to Rödby.*

846. Hyllekrog is the easternmost of the dry sand ridges that border this part of the shore of Laaland: two sandy shelves with only 1 to 2 feet water, lie abreast of the east end of the dry ridge, and close to the westward of these shelves, between them and Hyllekrog, there is a passage with 2 to 2½ feet water, but scarcely sufficient for a boat to pass through the narrow gut, even when the sea is smooth. Inside of Hyllekrog a very narrow channel, with 6 to 7 feet water, leads northerly to the rocky shoal of Skrollen. *Hyllekrog.*

847. From Hyllekrog, the Röd Sand stretches off in an easterly direction towards Giedser Point,* the southern extremity of Falster, and is there only separated from it by a narrow channel, with 3 fathoms water. This extensive sand is in some places dry, and in others only just covered in an ordinary waterstand. *Röd Sand.*

* See Plan of Giedser Reefs and Nysted Harbour.

There are two navigable channels across it, called the Vestre Mærker (Western Marks), from its having been marked by beacons when formerly a ferry crossed from Nysted to Heiligenhafen in Holstein, and the Östre Mærker, each having 7 feet water; and farther to the westward a 2-feet passage for boats. The sand between Hyllekrog, and the Vestre Mærker is broadest toward Hyllekrog, on the outside very steep to 2 fathoms, but gradually sloping to 4, the bottom being fine gray sand and pebbles in the vicinity of the shoal; but to the eastward of the Vestre Mærker gravel and stones prevail, and farther out, in 5 fathoms, sand and shingle. On the edge of this long sand there are some irregular ridges and patches that project from it; the outermost of them is the Schönheider, extending E. and W. more than half a mile, and being 1 to 2 cables' lengths across. From its shoalest part, with 12 feet water, Nysted church bears N. ¼ W.; Giedser Point E. ¼ N.; and Veigerlöse church in one with Skielby mill. From the west end of the shoal, in 17 feet water, Veigerlöse church is just visible open to the eastward of Giedsergaard Wood, and Nysted church in one with the middle of Kiettinge Wood. You are to the eastward of the shoal when Veigerlöse church is seen half way between Skielby church and mill; and to pass to the southward of it, Giedser lighthouse should not bear to the eastward of E.N.E. before you are sure of being to the eastward of it. To the southward the shoal slopes pretty steeply to 4 fathoms.

Schönheider Shoal.

N.N.W., a mile from the Schönheider, there is another small rocky patch, on which the least depth is 17 feet. With northerly winds the whole of this flat affords a good stopping-place, particularly to vessels going through the Belts, or to those not deeming it prudent with such winds to stand for Warnemünde Road.

Seventeen feet Patch.

848. On the inner side the Röd Sand is separated from the shallow along the shore of Laaland by a passage with 1½ to 3 fathoms water, but inside of Hyllekrog the sand is joined to the shallow by the Vitten Ground; between the dry rocky parts of which shoal, Vitten on its east end, and Skrollen on its west end, there is a passage for boats, with 3 feet water. Another extremely narrow passage with 6 feet water passes along the west and north sides of the Skrollen, between it and the little island of Ager, the shallow of which is barely covered. A passage with 7 to 9 feet water, along the north side of the Vitten Ground, separates this

Laaland Shallow.

Vitten Ground.

shoal from the Tidsel Ground, the shallow extending from Tiörneholm, and connected with the shallow from the shore of Laaland. *Tidsel Ground.*

849. Between the flats extending from Tiörneholm, viz. Tiörneholm Flat and the Tidsel Ground on the west side, and Lindholm Flat and the Bred Ground, extending from Lindholm, on the east side, is the inlet called Lambo Inlet, with a depth of 10 to 11 feet leading to an anchorage, at a short pier run out from the beach at Kiærstrup Wood, which inlet is marked by beacons on both sides. The mark of Slöse Mill in one with the west side of Ullebölle Wood, N. by E., will lead up the inlet until past the western beacon on Lindholm Flat; and then steer N.E. along the verge of this flat until past a beacon with a cross, standing on the N.E. spit of a neck of sand, extending eastward from Kalveholm, thence the course is W.N.W. towards the anchorage in 8 to 9 feet water. *Lambo Inlet.*

850. From the west point of Nysted harbour a range of shallows extends to the southward, the different parts of which are called the Harken, the Mett Ground, the Bred Ground, and the Lindholm Flat, and surrounded by these shallows, a basin of deeper water called the Klei Hole. Between the sandy neck of the Harken (extending to the S.E. from Heste Head, and having a beacon at its extremity in 10 feet), and the Mett Ground, there is a passage for boats with 4 to 5 feet water into the little basin called the Klei Hole, where they will find 2 or 3 fathoms. Another entrance to this basin is across the eastern end of the Bred Ground, in 5 to 6 feet water on the mark Vester Ulslev church open to the westward of Kiærstrup Wood. *Shoals off Nysted.* *Mett Ground.*

851. The Bred Ground extends to the eastward until abreast of the woody point called Hestehave Skov Point, and its S.E. edge in 6 feet water is on the mark: Nysted church in one with the east side of the wood, and 2 miles from the land: like the other shoals, the Bred Ground consists of sand with seaweed and rocks. *Bred Ground.*

852. From the Bred Ground and Mett Ground a flat stretches to the eastward between the Röd Sand and the shallow from the shore of Laaland, with which it unites in the vicinity of Flinthorn Reef, and this flat, called the Poller Grounds, has from 3 to 6 feet water and foul ground, but leaves a passage with 6 to 7 feet water, for which the mark is stated in Art. 856. Again, a shelf, called Rödsteen Reef, on the north side of the flat, and marked *Poller Grounds.* *Rödsteen Reef.*

by a stick, is to be left on the port side, in entering to Nysted; and also the Knoll, an insulated patch with 7 feet just outside

Johns Ground. of Rödsteen Reef. And, finally, Johns Ground, which shoal connects the flat with the shallow along the shore at Flinthorn, and thus forms, as it were, a bar across the inlet or channel to Nysted. The greatest depth on this bar is 11½ feet, with the mark of the west side of Folehave Wood a little nearer to Aalholm (Christiansholm) palace than to Nysted church.* Vessels too deep in the water to pass this bar are obliged to load or unload on the flat, where there is a good berth on the mark just mentioned, and with Veigerlöse church just open outside of Flinthorn Point. When over the bar the inlet to Nysted has a depth varying from 2 to 4 fathoms between the shore shallow and the Poller Ground, and as far as the beacon on the Rödsteen Reef, where the inlet becomes very narrow, between the Reef and the Knoll. There also the shallow, abreast of the estuary from Lille Sö, stretches 2 or 3 cables' lengths from the shore, and forms a rocky neck with 6 to 8 feet water, but steeply sloping to 12 and 16 feet.

Western Marks. 853. The main passage across the Röd Sand is called the Vestre Mærker, and leads across four sand shelves, on which the depth with an ordinary waterstand is exactly 7 feet. The mark for running into this inlet with the wind free is, the tower on Christiansholm palace shut in a short distance on the eastern edge of Hestehave Wood, or Nysted western mill well outside of the same wood; and after having crossed the sand shelves on this mark you may anchor in 10 feet inside of the Röd Sand, and be sheltered against all winds. Some rocks are passed on this mark with 5½ to 6½ feet water; and on the eastern side of the inlet, with Kiettinge church and the eastern edge of Hestehave Wood in one, these rocks are outside the shelves, which must be avoided in making the inlet.

Working into this passage, you should not stand more easterly than to the marks just stated; but you may stand westward until the western mill at Nysted is nearly in one with the east side of the wood, but then you will be in 6½ feet water only.

In foggy or hazy weather, when the marks are not visible, it

* It is said that a clean channel has been found across this bar, with 15 to 18 feet water, but, on either side of it, rocky, foul ground.

may serve as some guidance, that in the fair track, to the entrance, the bottom is soft, whereas on both sides it is hard sand.

854. Another passage across the Röd Sand is called Östre Mærker (Eastern Marks), about 1½ miles to the eastward of the former, and like it, is 7 feet deep on a sandy bottom; its direction from sea is N. ¼ E., passing to the westward of all the dry cays on the Röd Sand, and the mark for taking the inlet is the west side of Aalholm (Christiansholm) farmhouse, just in one with the eastern edge of Hestehave Wood. *Eastern Marks.*

855. If going to Nysted, you may follow the mark for the Western Marks across the Röd Sand until Skielby church and mill are in one, and then steer to the eastward on this mark until the small wood of Folehave is midway between Christiansholm palace and Nysted church. By following this new mark you pass without any risk between Flinthorn Flat and the east end of the Poller Grounds, and on this mark you should continue until a willow standing singly near the beach at Nysted is in one with the two eastern mills of the town, and there, at 1½ cable's lengths from the shore, good anchorage will be found in 2 fathoms water, or, instead of anchoring there in 2 fathoms, adopt this last cross-mark, and pursue it till Eegholm Wood is well on with the south end of Hestehave Wood, when you should steer N.W. by W. (passing to the northward of Rödsteen Reef) until Nysted church is in one with the conspicuous Fuglestone lying on the beach of Byhage. From thence steer W. by N. to the southward of Ladegaard Reef, a shelf of sand extending S.S.E. from the Battery Point, and marked by a pole standing in 10 feet water; and when the north side of Eegholm Wood comes in one with the south side of Hestehave Wood, follow that line until an old house (the dwelling of the custom-house officer) is in one with some whitewashed rocks on the beach. When at the battery you should steer N. until Skielby church is in one with Byhage Point. Here you are midway between the beacon poles on the Harken and on the Battery point, and you should then haul a little westerly, until a yellow house at the palace is in one with a remarkable hollow in Folehave Wood, on which mark you will steer N. by E. to the eastward of the outer post. From this post in to the pier a channel of 50 feet breadth has been dredged and marked by posts for warping, as well as by beacons on both sides. *Nysted.*

Farther in there is another pier constructing, to which it is intended to dredge out a channel of 10 feet depth.

856. After having crossed the Röd Sand, a shorter way may be taken to Nysted than that just mentioned to the eastward of the Poller Grounds by standing across this shoal, in the above-mentioned passage, with 6 to 7 feet water, and steering N. ¼ E. exactly on the mark of Christiansholm palace, just open to the westward of the battery on the east side, which is the leading mark until arriving at the common entrance pointed out by beacons.

Poller Grounds Passage.

Harbour.

Pilot.

857. To proceed into the road and harbour of Nysted you should make a signal for the pilot, who lives in the town, but meets vessels, even as far out as at the Western Marks.

Flinthorn Reef.

858. At the mouth of Guldborg Sound, which separates Falster from Laaland, the reef of Flinthorn extends from the S.E. point of the latter, and shoaling gradually, may be approached by the lead; but on the shallow from the opposite shore of Falster, to the westward of the cliff at the estate of Giedsergaard, in a depth of 2 fathoms, lies the Hiörne Stone, a single large rock carrying only 2 feet water. The marks for it are, Nykiöbing church midway between Steenkarret Point and the fisherman's octangular house on the cliff, and Nysted church over the northern edge of a farmhouse to the southward of the village Taagense. To pass up the Sound to the westward of the stone, keep Nykiöbing church just open outside of Steenkarret Point.

Hiörne Stone.

859. The channel between the eastern extremity of the Röd Sand and the shore of Giedser (the south end of Falster) is called the Krog Deep, in which there are 3 fathoms and more. Vessels coming from the westward, bound up this channel, may pass to the S.E. of the Röd Sand in 12 feet water, by keeping Giedser light-house in one with the red-tiled pilot-house. If coming from the southward, steer N. ¼ E. with Veigerlöse church in one with Giedser cliff, on which mark their least depth will be 3 fathoms over the flat off the Röd Sand. Either of these marks is to be followed, until Nysted church comes in one with the battery on Krog Point, which is the leading mark through the channel, until close up to that point, and the point should be taken closely, as only very near it will there be a depth of 3 fathoms. From thence coast along until abreast of the pier at the lake of

Krog Deep.

Sviinhave, where you may anchor in 2½ fathoms, 2 cables' lengths off the shore, on good holding-ground of clay, though containing a few rocks, and sheltered from all winds except N.W., which raises some sea.

There is also anchorage in the channel between Giedser Point and the Röd Sand before reaching Krog Point, but this should be in the widest part of the channel, where the depth is 4 fathoms, and the bottom clay and mud. The mark for the best berth is the lightkeeper's house (the highest of the buildings with a roof of red tiles) in one with the fourth house from the point near the beach. It is not, however, advisable to anchor there during unsettled weather with southerly or westerly winds, as they produce a rough sea, and even ground-breakers on the Röd Sand.

Working through this channel, while in the outer and shallow part of it, you may stand to the westward until Nysted church is in one with Krog Point, and to the eastward until in one with the battery. But this mark does not serve farther than half way between Krog and Giedser Points; after which the channel is deeper, and the lead must be used, not standing within 3 fathoms on either side, as the water there shoalens very quickly, and as in the channel the bottom is soft, while on both sides it is hard. By attending to these directions, vessels may work through in safety.

860. Vessels not drawing more than 9 feet may proceed directly to Nysted by coasting along the Falster shore, at the distance of 1½ cables' lengths from abreast of Krog Point, until Skielby church and mill come in one, and then proceed as directed above. Vessels drawing 7 feet only can pass up Guldborg Sound to Nykiöbing. (See Art. 591.)

The south-east end of the Röd Sand is connected with Giedser Reef by an extensive flat, and across this flat and along the reef is the just-mentioned Krog Deep, but to the westward on the flat there are irregular depths and several shallow patches.

861. On Giedser Point stands a tower 37 feet high, with a Fixed light, which being 66 feet above the level of the sea is visible 12 miles off, and in all directions from seaward, or between S. by W. ½ W. round by the eastward to S. by E. ½ E., and on the extremity of the point there is a beacon, consisting of a pole and a barrel; this beacon and the lighthouse in one indicate the direction of the Trindel shoal. Between the lighthouse and the

Giedser Light, and Shore Beacon.

Pilots. beacon are houses for pilots, who attend when the signal is made.

Giedser Reefs. 862. Giedser Reefs stretch off 4½ miles S.E. by S. from the point to the depth of 4 fathoms outside of all, and they consist of a connected ridge of sand and stones, though with several bendings; the depths, also, are irregular, and it is too steep to be approached by the lead.

On the innermost half mile of the ridge the depth is less than 2 fathoms; and half a mile from Giedser Point a floating beacon with one broom is placed. On many parts of that interval the large rocks are scarcely covered; but farther out, as far as 1½ miles, the depth increases to 17 feet; and there the reef branches off forming two shelves, of which the northern one for 4 cables' lengths has a depth of 20 to 23 feet, and the southern for more than a mile is so narrow that soundings on it can only be obtained while the lighthouse is visible between the pilot's house and the beacon, the depth then being 23 feet, very steep on both sides, and 5 fathoms close to. The reef farther out widens a little into a flat with 17 feet water, and continues to expand, with a depth of 19 feet as far as another patch, 3 miles from the point, and carrying only 12 feet water.

Swatchway of 20 feet. 863. Between these patches the reef may be crossed without having less than 20 feet, when the lighthouse is in one with the shore-beacon, and at the same moment the churches of Skielby and Gieddesby likewise in one. Outside of this 12-feet patch, the reef trends more to the westward, and is nearly a third of a

Trindel. mile across, with not less than 18 feet as far as the Trindel shoal, the north end of which is 3⅝ miles from the point. This dangerous patch, consisting of sand and rocks, is steep-to on all sides, especially to the eastward; and its shoalest part, where the ridge is very narrow, has but 7 feet water, at which spot the shore-beacon is just in one with the west side of the lighthouse. To the southward of the Trindel there are two insulated patches with 11 feet each, and separated by a

Giedser Floating Beacon. passage with a depth of 4½ fathoms. Outside of them there is another beacon, a floating one, with a red pole and two brooms, in 4 fathoms water, five-sixths of a mile, S.S.E. ½ E. from the Trindel, and about 5 miles from the lighthouse, which shows a little to the westward of the beacon.

864. These shoals have been recently more minutely examined,

from which survey it appears that, separated by a channel with 4 to 5 fathoms water, from the above insulated patches, there is a crescent-formed flat with 22 feet water over it, and extending 7 cables' lengths N.W. and S.E., on which there are two rocky patches:—one, called the Outer Knob, with 11 feet lies 9 cables' lengths from the beacon and upwards of 6 miles (12,207 yards) from the lighthouse; the other with 12 feet water, lies 2½ cables' lengths to the westward of the former. Farther out, in the same direction, nearly 8 miles from the lighthouse lies a patch called Varsko, with 18 feet water, which is supposed to be the shoal on which a Russian corvette struck. A flat with 23 feet water, shown on some English charts, and said to lie 9¼ miles from the lighthouse, has not yet been found. None of the above patches can be avoided by the lead, they are so small, and rise so suddenly from 5½ fathoms; but you are to the westward of them all, and of the reef also, when the churches of Skielby and Gieddesby are in one. There being no marks for clearing these shoals to the eastward, we can only advise vessels, when standing towards them, not to come into less water than 10 fathoms; for with this depth, and with soundings of brown or fine yellow sand and sleek, you may be sure of being clearly to the westward of the reef, which may afford some information during dark or foggy weather.

Outer Knob.

Varsko Patch.

865. This singular reef with all its dangerous patches, and especially that of the Trindel, offers in certain places a sufficient depth even for large ships to cross it; and as these openings might be of great use on many occasions, it will be proper to give here some brief directions for that purpose.

Openings in the Giedser Reef.

1. To pass across the deepest part of the reef, when coming from the south-westward, steer direct for the lighthouse on the compass-bearing of N. 18° E. until you reach into 4 fathoms on the flat; then steer E. ¼ S. until Veigerlöse church is well open to the eastward of the cliffs which stand to the eastward and northward of the point, when that church will bear N. ¼ E.; then run N.N.E. ¼ E. half a mile, or until Nysted church comes in one with Krog Point; from whence a course of N. ¼ E. will lead towards the opening until the lighthouse comes between the pilot-house and the beacon; you must then steer E. ¼ S., and when the lighthouse is in one with the shore-beacon the reef is passed. If the above courses are made good for the effects of current and leeway, the least depth you will have will be 23 feet.

1. *From S. W.*

2. *From S.* 2. When Veigerlöse church is open to the eastward of the cliff, bearing N. ½ E., while at the same time the lighthouse bears N. by W. (but nothing more to the westward), you may stand across the reef by steering N. by E. ⅛ E. to N.N.E., without having less than 21 feet water.

3. *From N.* 3. Coming from the northward, when about a mile to the eastward of the point, the reef may be passed in 20 feet by bringing Skielby and Gieddesby churches in one, and the lighthouse to bear N. 58° W.; then steer S. by W. ⅛ W. across the reef, and your least depth will be 20 feet, and this only on a single spot, which is passed when the lighthouse opens W. of the beacon. By continuing this course about 2 miles further, or until Veigerlöse church is in one with the cliff, the depth will be 5 fathoms, and then you may steer W. by S., being clear to the southward of the Röd Sand, the S.E. spit of which is passed when the lighthouse bears N. 18° E.

4. *From W.* 4. Vessels coming from the westward, having run outside of the Röd Sand by the lead, may stand in towards that sand upon the mark of Veigerlöse church midway between Skielby church and mill, which leads to the eastward of the Schönheider Shoal, and when the lighthouse bears N. 65° E., the depth will be 5 fathoms. Then steer E. until the lighthouse bears N.E., which will reduce the depth to about 4 fathoms; and then E.S.E. until the lighthouse bears N. You will then be in 5 to 5¼ fathoms water, in the Krog Deep, and may steer N.E. or N.E. ½ E. across the reef, in not less water than 18 feet, and this only on the narrow ridge, when the lighthouse and shore-beacon are in one. This is the most common way of crossing the reef, and is that usually adopted by the steam boats; and even at night, if the weather is clear, and the lead very rapidly hove, and the compass lively, and the pilot having a thorough knowledge of the current, so as to allow for its influence on the courses. The current generally runs with the wind, particularly in blowing weather, and its velocity across the reef is increased or diminished by the stream setting in or out of Guldborg Sound.

Current at the Giedser Reefs.

5. *Inner Pass for small Craft.* 5. Coasters, and in general all vessels not drawing more than 12 feet, may stand across the reef without any difficulty, provided they are outside of the inner and shallow spit which projects two-thirds of a mile from the point; and this may be done by keeping the lower edge on the uppermost vents under the

lantern of the lighthouse just in sight over the highest part of the cliff on the point, when seen from the deck of a vessel, with the eye 9 feet above the level of the sea. With the lighthouse and the beacon in one you are to the northward of the shallow spit of the reef; and when Nysted church is in one with Krog Point battery you are to the southward of it.

Close outside of the patches to the S.E. of the reef, or nearly 10 miles from the lighthouse, there is a deep channel called Cadet Renden (Midshipman Channel) which is 2 miles wide, with a depth of 12 to 17 fathoms, the bottom in mid-channel being mud and sleek. From the south side of this channel the water shoals suddenly to 10 and 9 fathoms, sandy bottom; from this depth the shore shallow from the Mecklenburg shore inclines gradually, so that this deep channel will in some measure serve as a guidance in thick weather to vessels rounding the Giedser Reef. Some deeper holes are said to exist in the flat to the westward of Dars, in the direction of the Cadet Renden. Giedser Light in conjunction with those on Femern, at Warnemünde, Dars, and Rügen, contribute greatly to the safe navigation of this sea. *Cadet Renden.*

866. Between Giedser, Warnemünde, and Dars, the current runs with the same velocity as in the Great Belt, and frequently with easterly or westerly storms it attains a rate of 3 to 4 knots in the direction of the wind. *Current.*

867. From Giedser the shore of Falster to the north-eastward is perfectly clean, with a gradually-sloping shallow along the shore, which may be everywhere approached by the lead, the bottom being sand. From Giedser Point to the village of Bötö, the shallow is, however, very narrow, with 3 fathoms water near the beach, but to the northward of Bötö it expands, and a depth of 4 fathoms is found 1¼ miles from the shore. On the shallow there are some shelves a mile off, and a few rocks near the beach. The Bötö Nor is an extensive sheet of salt water, separated from the sea by low sand-downs; and in the opening or inlet through which the Nor communicates with the sea, the depth is generally a foot, when on the mark of Gieddesby church-steeple in one with the middle of the ridge of the roof over the nave. Formerly this was a harbour from which a ferry crossed to Rostok. From Veigerlöse church, at the north end of the Nor, the shore is higher, and the shallow diminishes in breadth. Abreast of Tunnerup, sand and sleek will be found from 1 to 2 cables' *Falster Shore.* *Bötö.*

lengths from the beach, and small vessels anchor there in 14 to 17 feet, in order to load wood. Some rocks, however, lie along the beach, particularly at the woody points.

Pomle Head. *Præstebierg Reef.*

868. In the vicinity of Grön Sound the shallow stretches 1¾ miles off shore from Pomle Head to Præstebierg Reef; all foul ground, with from 14 to 17 feet water, and with two patches of rock, one carrying 8 and the other 11 feet. The mark for the shoalest part is, the hill of Præstebierg in Möen in one with Heste Head, and Aastrup church, in Falster, just visible in an opening of the wood. To pass outside the reef in 17 feet water, keep either Phanefiord church, or else the remarkable yellowish cliff of Madses (both in Möen), well open to the eastward of Heste Head.* In the bay, called Hesnæs Vig, to the southward of Stubbe Point, vessels may anchor in 2½ to 3 fathoms, 2 or 3 cables' lengths from the beach, abreast of Hesnæs house, and be there sheltered from N.N.E. to W.S.W. winds. Grön Sound,† which separates Falster from Möen, has three distinct inlets, formed by the Tolk Grounds, two large banks in the mouth of the estuary; the Gamle (Old) Tolk, lying to the southward, and the Ny (New) Tolk to the northward. To pass outside of these shoal banks in a depth of 3 or 4 fathoms, the third woody point of Falster, to the southward of Heste Head, is to be kept about a point open S. of the head.

Grön Sound.

Tolk Grounds.

869. Both Tolk Grounds consist of very fine, compact, whitish sand, which, like quicksand, rapidly yields to the effects of gales and waves. The least depth on the New Tolk is 6 feet, whereas on the Old Tolk, particularly on its northern side, there are patches with only 1 to 2 feet water, and sometimes they dry.

Fleske Ground.

870. Besides these two shoals, farther in lies the Fleske Ground, a flat upon the Möen Shallow, which extends along that shore from Madses Cliff to Harbölle Battery. On this flat there are 4 to 5 feet water, but between it and the shore of Möen there is a passage with 6 to 11 feet. Still farther in, in the throat of the Sound, and upon the Falster Shallow, lie three other shoals; first the Middel Ground Sand, with from 9 to 11 feet, secondly the Steenrön, a 6½ feet ledge of rocks, and, thirdly, the Gaase Sand,

Middel Ground. Steenrön.

* Small vessels may cross the reef inside of the two patches, in 15 feet water, by keeping a little green hill, called Maalenhöi, in one with Heste Head.

† See Plan of Grön Sound and the Stor Ström.

a narrow spit extending from the point, with only 4 feet water. *Gaase Sand*
And finally, to the southward of those three shoals, there are two more called the Revlers (shelves), with 9 to 11 feet water, the *Revlers.* inner one being a little knoll, but the other a shelf of some length.

871. The three above-mentioned inlets pass between these shoals; they are called, the Heste Deep between the shallow off Falster and the Old Tolk, the Tolk Deep between the two Tolk Grounds, and the Möen Deep between the New Tolk Ground and the Möen Shallow and Fleske Ground. In all these inlets the depth of 12 feet will be found on their shallowest parts; but the most-frequented passage is the Heste Deep, because it possesses the best *Heste Deep.* marks; and moreover, three pilots are stationed on Heste Head, to meet vessels coming in, besides which there is a black buoy in 13 feet water, carrying a flag on the point of the Old Tolk, at the mouth of the inlet.

To enter this Deep, and to pass to the westward of the buoy, bring the west edge of Baagö Wood in one with the turret on Battery Point,* and this mark should be followed until Koxeby Mill comes close to the westward of Phanefiord church, on which mark then steer between the two shelves until Baagö Mill opens outside of the battery point on Falster. You are then in the fair track, and may proceed into the Sound, for you may approach the shore of Borreknoll within the throw of a stone.

When working in through the Heste Deep, and while between Ablevig battery and Næsby, you should not stand nearer towards Falster than into 2 fathoms, as the shallow is foul inside of that depth.

With a S.E. gale, which raises a rough sea in Heste Deep, along the shore of Falster, you should, as soon as possible, cross over into the Tolk Deep, after passing the battery and the pilot-houses on Falster. When Phanefiord church is in one with a bush standing on the beach of Möen, to the eastward of a small grove, you may steer N. by E. on that mark through the New Deep, *New Deep.* between the Tolk and the Revlers, where the least depth will be 12 feet, and when through, the depth will be 3 fathoms or more in the Tolk Deep. When the west edge of Baagö Wood is well open of the battery point, take nearly the midchannel of the Sound,

* The turret on Battery Point stands a little to the southward of the Pilot houses; it is 33 feet high, and has a pole surmounted by a ball 5 to 6 feet in diameter, the top of which is 41 feet above the ground.

steering N. by W. through the Tolk Deep until Baagö Mill is open of the battery point, which may be rounded very close. This New Deep is likely to be in future the deepest inlet to Grön Sound.

Tolk Deep. 872. The Tolk Deep is the least-frequented entrance, though an almost straight deep-water channel between the Tolk Grounds; but its mouth is barred by a 12-feet flat, which is connected with the two Tolk Grounds, and is only practicable to those well acquainted with the intricacies of the channel, there being no other mark, than just to keep Grön Sound shut while standing in, and to steer in such a manner as to open it very slowly in advancing. The course in is about N.W. by W. until the west side of Baagö Wood is in one with the middle of the Sound, and then, Baagö Mill open outside of the battery point.

Möen Deep. 873. Möen Deep leads between the shore of Möen and the New Tolk shoal, it likewise has 12 feet water on its shoalest part, and is the most direct route for vessels coming from or bound towards Cape Stevns. To make this channel from sea, stand towards the little yellowish part of the Möen shore, called Madses Cliff, and then bring Stubbekiöbing church in one with the low point of Möen to the westward of Madses Cliff, which mark leads to the northward of the New Tolk. This mark, however, is not to be followed farther than until abreast of a small house standing half-way between Madses Cliff and the above low point; and then, in order to pass outside of the Fleske Ground, you must sheer off about W.S.W. until a single tree, which stands in a hedge on Falster, comes in one with the northernmost house on that island, and which then becomes the leading mark until the ferry-house on Möen is in one with Harbölle battery. You are now clear of the Fleske Ground, and may proceed to the westward of it till you fall in with the leading mark for the Sound, viz., Baagö Mill open of the battery point on Falster, which will conduct you through the narrows.*

Port Charges through Grön Sound. 874. Every passing vessel of more than 12 com. lasts. (about 30 tons), is bound to pay 8 rbsk. beacon money as long as the buoy on the Tolk Ground is in its place, and smaller vessels 4 rbsk., and all vessels passing through the Sound, and not taking a pilot, pay 32 rbsk. while the buoy is out; but if they only anchor at Ablevig from contrary winds or bad weather, and from thence again go to sea, they pay 24 rbsk.

* For the western entrance to Grön Sound, *see* Article 606.

CHAPTER XII.

BORNHOLM AND THE ERTHOLMS.

875. The Danish island of Bornholm in the Baltic, lies about 25 leagues to the eastward of Denmark, and 7 leagues to the southward of Sweden; though possessed of no harbours, it often affords shelter to vessels, either at anchor under its lee, or while standing off and on. It is in general high ground, and its most elevated point is the Rytterknegt Hill, which in the middle of the island rises 509 feet above the level of the sea. Hammer Point, at the north end of the island, is low, and still lower is Due Point, its southern extremity, which consists of quicksand. A Fixed light, 279 feet high, stands inside of Hammer Point, and if there had been a light also on Due Point, it would have prevented many a shipwreck. *Bornholm.* *Hammer Point.* *Bornholm Light.*

The most conspicuous object on the island is Ruth church, near its northern end, as it may be seen 32 miles, and in all directions, except when Rytterknegt Hill intervenes.

On the western side of the island there are two small towns, Rönne and Hasle; and on its eastern side Nexö, Svanike, and Allinge. To the south westward, from between Rönne and Due Points, a flat called the Rönne Bank extends 24 miles, or rather more than half-way to the island of Rügen, and on this flat there are numerous rocks and shoals, some of which are dangerous. A few of them are more than 20 miles from the island, but the greater number are at no great distance, and generally take the form of long shelves. The eastern side of this flat is steep from 20 to 7 or 8 fathoms; but to the westward it slopes gradually into deep water. *Rönne Bank.*

876. Rönne is the capital of Bornholm, and has a thriving trade; it despatches several fishing-vessels to the Arctic seas, and ship-building is also actively carried on; vessels may obtain some supplies there, and it keeps up a regular communication by packets with Copenhagen. The harbour is formed by stone piers, and will admit vessels drawing 11 feet. *Rönne Harbour.*

877. The outer road is sheltered by two short reefs, the northern *Rönne Road.*

one, extending W.S.W. from the town about 2 cables' lengths, consists of large rocks, some of which are dry. The other has likewise some large rocks, and projects W.N.W. about 3 cables' lengths from the point south of the town, where the castle stands, and commands every part of the anchorage. The extremities of these reefs are marked by broom beacons in 21 feet water, and inside of them lies a mooring buoy to which a vessel of 18 to 20 feet draught may make fast.

Rönne Reef. The outer ends of these two reefs incline towards each other, but so as to leave an entrance between them of more than a cable's length wide; and 2 cables' lengths farther out lies the

Trindel Shoal. Trindel shoal, over which there being from 16 to 20 feet water, small vessels may cross it when the sea is smooth, but large ships must either take the northern or the southern entrance. The extent of the road inside of the reefs is very limited, but in its outer part there are 4 or 5 fathoms water, which quickly

Pilots. decreases in advancing to the eastward or southward. Pilots readily attend when the signal is made, if not prevented by stress of weather; but in such a case a vessel might enter the road by keeping the New Windmill in one with the northern gable of the church till a large and remarkable rock on the northern reef is in one with Ruth church, when she must let go her anchor; but to swing free, she should not veer out more than 25 fathoms of cable, and then moor under the directions of a pilot. The road is exposed to the W.S.W., and during a gale from this point, the Trindel, instead of affording much shelter, rather occasions ground breakers, ranging over the whole roadstead and adding much to its danger. Only small craft can work out, large vessels are obliged to warp out.

Rönne Harbour Lights. For the guidance of vessels desirous to enter by night, two lights are exhibited on the shore, at the height of 29 and 52 feet, which can be seen 8 miles off, and being kept in one will lead into the harbour. Vessels wishing to enter must hoist a light, which will be answered from the shore by a lantern shown under the low light.

Dyner Rocks. 878. On the shallow immediately to the southward of Rönne, lie the Dyner Rocks even with the water's edge, and stretching out

Gaase Ground. from Rönne castle; and also the Gaase Ground, a small shoal with 6 feet water; as well as the Hadding, a short reef, partly

Hadding Reef. above water. To pass outside of the Dyners, keep Ruth church

in sight outside of the shore at the town of Rönne; and Rönne church kept outside of the flag-staff on the castle leads outside of the Hadding.

879. Off the point, at the village of Arnager, a very shallow reef partly above water, extends in a S.E. direction parallel to the shore, but you will pass just to seaward of it when Baune Point, which is rendered conspicuous by a stone beacon, is seen inside of a house standing on a point of high land to the westward of Baune Point. Ships of all sizes may stand into this bay by passing between that reef and the Black Shoal, and only minding to avoid the Middel Ground, which is a small patch of rocks with 12 feet water in the middle of the bay. *Arnager Reef and Bay.*

880. A passage across the Arnager reef, called Store Gab, or Main channel, with a depth of 12 feet, divides the reef in two parts, of which the innermost is called the Öring, and the outer one Arnager Reef. *Store Gab.*

The mark to lead through the Store Gab is, to keep a lonely farm, called Lille Strandby Gaard, in one with the Gröft, a remarkable cleft in the cliff on the beach. While on this mark you are just outside of the reef as soon as the Selle Stone, a rock which stands on the Öring, and 2 to 3 feet above water, is in one with Arnager village, or with a brier standing on the beach; and you are inside of the reef, and in the bay, when the Selle Stone is in one with a small guard-house placed close to the westward of Arnager village. *Selle Stone.*

881. Across the Öring there is a 4-feet pass for boats leading along the shore to Arnager inside of the Selle Stone, and pretty close outside of the Haare Stone.

In the innermost part of the bay the depth is 2½ fathoms, which gradually increases outwards to 5 fathoms on a fine sandy bottom, but everywhere covered by large stones, so that chain cables there are indispensable. With winds between S.W. and S.E. this anchorage is entirely open.

882. Abreast of Arnager Bay, a short mile S.W. of Sose Point, lies the Blak, a small shoal of flat stones, with 5 feet water; but you may pass between it and the shore-shallow by keeping the Haare Stone rock in one with Baune Point. *Blak Ground.*

883. On this side of Bornholm are the following small shoals: 1, the Rönne Bakke; 2, the Hvide Mær, and 3, the Höibratt, each with 22 feet water; 4, the Nydybet, 27 feet; 5, the Klinte *The 17 Shoals.*

Ground, 25 feet; 6, the Træbeens Ground, 24 feet; 7, the Orge, 30 feet; 8, the Diebratt, 37 feet; 9, the Blisbratt, 31 feet; 10, the Bukketöiet, 32 feet; 11, the Akra Ground, 31 feet; 12, the Iver Stavling, 30 feet; 13, the Vangeled Knoll, 34 feet; 14, the Bakke Ground, or Rönne Stein, 18 feet; 15, close outside of this last one the Bakkebrat, with 22 feet water; still farther out, 16, the Kose Ground, with 6 fathoms; and 17, the Stablers, with 8 fathoms. The marks for the Bakke Ground, which is the outermost and most dangerous, are Rönne church and castle in one, and Aakirke church midway between Jylagaard and Little Bakkegaard, two farms on the cliff. There are many other marks, but they could be understood only by those acquainted with the place, and all large vessels ought therefore to keep outside of the whole cluster.

884. To the southward of the Bakke Ground, and 20 miles from Bornholm, the sea is perfectly clear of any dangers, with a depth of 7 to 10 fathoms, on shingle and sand; but towards the extremity of the bank it again shoals up to three dangerous patches of rock, viz., the Adlers Ground, with 14 feet; another patch, a mile to the N.W. by W., with 18 feet; and a third S.E. by S., distant half a mile, with 22 feet water. The Adlers Ground lies in 54° 47′ N., bearing S. 42° 45′ W. (true), from Rytterknegt Hill, on Bornholm, and N. 64° 15′ E. from the north point of Jasmund on the Main, both of which places are just visible from the shoal. These three latter shoals may be avoided by the lead, and large vessels ought not to stand too far in on the rocky flat round them.

Adlers Ground, and two other patches.

S.W. Coast.

885. The shore from Arnager Bay to Due Head is clean, with a narrow sloping shallow, and with only a few rocks off Baghammer and Ölhammer Points. Accordingly, vessels may anchor on that shallow, with winds off shore, in convenient depths; one good berth will be found in 9 to 11 fathoms, with St. Peders and Aakirke churches in one. Due Sand, off the Head, is of small extent, but is not to be approached by the lead, being steep from 7 fathoms to 2. The flat within the depth of 10 fathoms, extends a mile off, but then falls steeply into deep water, which may be some guide in sounding. To the eastward of Due Head the flat is somewhat wider, and offers a good stopping-place with N. and N.W. winds, though seldom used by small craft on account of the swell, with Aakirke church nearly in one with St.

Due Sand.

Paul church, in 6 to 8 fathoms, and a clear sandy bottom, and from whence the largest ships can easily get away if required.

886. Between Due Head and Nexö there are two small reefs, called the Broer and the Salthammer, but the bight between them is clean sand, and is therefore sometimes resorted to by coasters or other small craft. In the bay, to the northward of Salthammer Reef, there are rocks, and the bottom is foul. A remarkable willow, split in two, in one with the high land behind Nexö serves as a mark to pass outside the Salthammer. *Broer and Salthammer.*

887. Nexö Road is the most-frequented anchorage off Bornholm; less swell is felt here than at Due Head, and a wider shelter; but it is more difficult to quit if the wind should suddenly come in from seaward; and vessels not provided with chain cables ought to bear in mind that the bottom, consisting of a red and brittle sort of limestone, is apt to damage a hempen cable. The nature of the bottom requires that the anchor should not be eased down, but let fall at once, in order to break through the flags. The best berth is considered to be Böets church in one with the harbour flagstaff, in 8 or 9 fathoms water, but the space is limited, as the depth suddenly increases farther out, and vessels would be liable to drive if they should anchor on such steeply sloping ground; to prevent which it is usual, in anchoring there, to pay out three or four times as much chain as the depth requires. The fishermen here commonly offer their service as pilots, and it is advisable to take one, in order to secure a good berth. *Nexö Road.*

The harbour at Nexö admits only small craft not drawing more than 5½ feet. *Nexö Harbour.*

888. The coast from Nexö to the northward is perfectly clean: the single rock of Maltgœrn is close in-shore; and abreast of the fishing village of Aarsdal there is good anchorage in 9 or 10 fathoms, on sandy ground, but sheltered against the wind from N.W. to S.W. The anchorage, however, is very close in-shore, and with northerly or southerly winds a heavy swell sets in. *Maltgœrn Rock.*

889. At the little town of Svanike there is a small and very indifferent harbour, with a depth of 7½ feet; nevertheless several vessels are built there. Off Bolshavn village there is good anchorage in about 8 fathoms water, with W. and S.W. winds, but from N.W. they occasion a heavy swell. Anchorage may be had also abreast of the whitish beach at the village of Meel- *Svanike. Bolshavn. Meelsted.*

sted, with winds from W.N.W. to S.S.W., in 7 to 9 fathoms, sandy bottom.

Gudhiem. 890. The large village of Gudhiem, like the rest, is inhabited by fishermen; it stands on a projecting point, and has a harbour for boats, with 3 to 4 feet water; and from thence the passage is commonly made to the Ertholms, or Christiansö. The bay immediately to the northward of Gudhiem Point offers good shelter, *Allinge.* in 7 or 8 fathoms, with southerly winds. Off Allinge, anchorage may be taken with winds from W.N.W. to S.S.W., but the ground slopes steeply. In 7 fathoms, where the bottom consists of sand, gravel, and a few rocks, you are sheltered from N.W. to South; but the swell is annoying, and the common anchorage is farther out, with Allinge church bearing about W.S.W.

Sandvig. 891. In Sandvig, to the eastward of Hammer Point, anchorage may also be found; but if the wind veers round, a vessel must get away immediately, lest by remaining too long it might prove difficult to weather the point. At Sandvig there is a boat-harbour, with 5 feet water. In all the different anchorages between Nexö and Hammer Point the holding-ground is less good, and at the same times slopes more steeply than in the southern roadsteads.

Hammer Point. 892. Hammer is a sandy point forming the northern extremity of Bornholm, but when seen afar off it appears like a low island; and being perfectly steep-to, great caution is necessary at night, as the high land behind renders it very difficult to perceive. On the western side of the Hammer, to the northward of the lighthouse, there is a stopping-place with easterly winds, but when the wind veers as far as N.E. it is no longer safe. To the south-westward of the lighthouse small craft may find shelter in Sem Bay, in 6 to 7 fathoms, abreast of the ruined castle; and larger ships farther out, with Hammerhuus bearing S.E. by E., and the north end of the island E. ½ N., in 15 fathoms water, on fine sand.

Hammer Light. 893. The Hammer Light stands on a hill called Steilebierg, elevated 279 feet above the level of the sea, and owing to its high position it is sometimes involved in mist; it is a Fixed light, and may be seen 20 miles off, when the atmosphere is clear.

David Bank. 894. N. by W., 6 miles from the lighthouse, lies David Bank, apparently all sand and in the depth of 20 fathoms, extending 2 miles N. and S., and two-thirds of a mile E. and W., but on its

north end it rises to within 6½ fathoms of the surface for about 2 cables' lengths. The lighthouse *in* one with the church of St. Ole is an eastern tangent to the bank; but the marks for the shoaler part are the lighthouse in one with a sand-cliff to the northward of it, though a little nearer the east than to the west side of the cliff, and Allinge Mill somewhat closed in upon Hammer Point. The angular altitude of the lighthouse, when on the shoalest spot is 0° 24'. This bank is the usual fishing-place of the Sandvig fishermen.

895. From the Hammer to Hasle the narrow shallow is perfectly clean, and at that village there is a 7-feet harbour for the small craft belonging to it. From Hasle to the southward, towards Rönne, the shallow is somewhat wider, and has three rocky ledges, viz. Sorte Hat Reef, to the southward of Leuka village: it is but short, and derives its name from a large rock called the Black Hat, lying on the reef. To the southward of this comes Ny Kirke Reef, extending more than half a mile from the shore, with a depth of 5 feet on its rocks; and thirdly, and farther to the southward, is the reef of Hvide Point, or of Knud Kirke, carrying from 3 to 4 feet, and projecting nearly a mile off shore. Ruth church in one with Sorte Nak (the first point to the southward of Hasle), leads clear of all these three reefs; and to pass outside of Ny Kirke Reef, keep Hasle church spire in one with a small conspicuous grove on a high hill. Rönne Castle in one with the church will also clear Ny Kirke Reef, but then it leads right on Hvide Reef; the castle, however, run out to the pier-head will clear both reefs; and on this mark, when Ruth church is in one with Sorte Nak Point, you are abreast of the end of the reef in 7 or 8 fathoms water; and at the same time, Knud church, situated inland, is in one with a farm called Peter Jörgensens' house, near the beach. Along the western side of Bornholm, to the northward of Rönne, good anchorage may be had with easterly gales.

Hasle Harbour.

Sorte Hat Reef.

Ny Kirke Reef.

Hvide, or Knud Kirke Reef.

896. To the north-east of Bornholm, about 10 miles, lies a little group of islands called the Ertholms, consisting of Christiansholm, Frederiksholm, and Græsholm, with several surrounding rocks and cays; they are all generally called Christiansö, that being the name of the fort on Christiansholm.* The narrow sound between

Ertholms or Christiansö.

* *See* Plan of Christiansö.

this island and Fredriksholm forms a safe harbour, except with N.N.E. gales; a floating-bridge joins these islands, and divides the harbour into the northern and southern inlets. This harbour is of great consequence to the Baltic traders during severe icy winters, as vessels may find tolerable shelter, and even be repaired there, hove down, and furnished with supplies. The harbour is, however, so narrow, that from 30 to 40 vessels only can find room, and it is sometimes quite full.

Pilot. When vessels make the signal for a pilot, the colours are hoisted on the castle tower, and the pilot is ordered out, provided the harbour will admit any more vessels; but if this is not possible the colours are not hoisted. However uncommon, it may happen that the pilot by stress of weather is prevented from getting out, in which case the following directions for making the harbour may be of great importance:—

South Inlet. 897. Into the southern inlet vessels drawing not more than 13 feet only can pass; but the northern inlet has sufficient depth for ships of all sizes to enter, though a 44-gun frigate is the very largest that may be turned round when inside.

898. With the winds from N. to E.S.E., vessels coming from the eastward, and going into the southern inlet, should stand close to the southward of the East Skær, then round the south end of the island very closely, and bring up close to Christiansholm, between *Snark Rock.* it and the Snark sunken rock, on which there is a beacon. Here the pilot will be in readiness; and if the wind be too scant to fetch into the harbour, the sail must be quickly furled, a hawser made fast ashore, and another carried out by the pilot vessel, to warp into the harbour. People are always at hand to assist if required. If coming from the westward, pass close to the eastward of the Snark, though the beacon is frequently carried away, and then act as above directed. The water is deeper in the northern inlet, and during S. or S.E. gales the southern one cannot be approached.

North Inlet. When S. or S.E., coming from the eastward, the north point of the island called Gyldenlöve Head, is to be taken so very closely that with a southerly gale it is even necessary, in order to be able to fetch into the harbour, to pass between this point and the Kull, a sunken rock, carrying 12 feet, and only 200 feet from the shore.

Kull Channel. The mark for this passage, called the Kull Channel, is to keep the two beacons in one which are placed on Græsholm; one of them is round and the other square. The Kull Rock is passed

when the beacons on Gyldenlove Head and at the sun-dial are in one. The pilot will be in waiting there, with a hawser, if the wind be too scant to sail into the harbour; but if you can do so, hug the weather-shore, and let go the port bower when in a proper berth.

899. With the winds from S. to W. you must stand through the Taarn Channel, between Fredriksholm and Græsholm; and when abreast of the Jomfrue rocks, on the Græsholm side, let go the port anchor, and pay out cable until you are abreast of the Spro rock off Fredriksholm, where the pilot will be ready with hawsers to transport the vessel one or two cables' lengths into the harbour. *Taarn Channel.* *Spro Rock.*

900. With winds from W. to N., pass between That Isle and Skaaning Reef, and as soon as the two beacons at Frederiksholm are in one, keep them so, which will lead to the eastward of the Skaaning Reef and the Hasê Rock, on which there are only 14 feet. When abreast of the Hasê, the beacons on Græsholm will be in one. You must approach the harbour between the two marks for the east side of the Hasê and for the west side of the Kull, shortening sail by degrees, and letting go the starboard bower when in the harbour's mouth, where a hawser will be in readiness to carry to the shore. *That Isle.* *Hasê Rock.*

From the narrowness of the harbour, as well as of the channels which lead into it, no strangers ought to enter without a pilot; but when inside, strong mooring-rings will be found in the solid rock, and mooring-poles in several places. On applying to the governor, hawsers and warping materials will be furnished on very moderate terms. Vessels may heave down there, and be provided with provisions; and fresh meat and other refreshments may be obtained from Bornholm. Fishing is the principal business of the inhabitants.

901. It is to be observed that the round beacons or pilot-marks are painted white, and the square ones black. *Beacons described.*

902. These low islands and shoals would be extremely dangerous during the night, if not indicated by a light to guide the navigator; but a Revolving light is now placed in the tower of Christiansholm castle, elevated 94 feet above the level of the sea, exhibiting a bright light every 20 seconds, and visible 14 miles. At a great distance no light is perceptible between the flashes, but on approaching, a faint gleam is given out from the reflectors. *Chistiansö Light.*

CHAPTER XIII.

FROM THE SCAW OR SKAGEN, TO THE HORN REEFS.

Description of the Coast.

903. THE coast between the Scaw or Skagen and Blaavand Point, is iron-bound, without harbours or refuges, and consequently should be avoided with all winds not blowing off shore.* Along it, a bank extends, consisting chiefly of three ridges, but between the Hanstholm and Blaavand Point of two, yet, in some places of only one ridge, all of very compact sand, and occasionally stones, and lying parallel to the coast, at nearly equal distances from it and from each other. The few shipping-places there are chosen in the least hazardous parts, where the distance of the ridges from the coast, and from each other, together with their depth, make embarkation practicable.

The outer ridge is in general distant 3 to 4 cables' lengths from the beach, commonly with a depth of 18 feet; the next ridge, with 11 to 12 feet water, is a half to a cable's length inside the

Lifeboats and Rocket Apparatus.

* Along the west coast of Jutland, where from the want of harbours or places of refuge, so many vessels are shipwrecked, life-boats with rocket apparatus, or the latter only, have been recently established at the undermentioned places:—

Scaw, life-boat and rocket apparatus.
Hirtshals, ditto ditto.
Lönstrup, ditto ditto.
Lökken, ditto ditto.
Blokhouses, ditto ditto.
Slette Strand, rocket apparatus.
Lild Strand, ditto.
Hantsholm, life-boat and rocket apparatus.
Klitmölle, rocket apparatus.
North Vorupöre, life-boat and rocket apparatus.
West Agger, rocket apparatus.
Agger Canal, life-boat and rocket apparatus.
Tybo Rön, rocket apparatus.
Flyvholm, life-boat and rocket apparatus.
Tuskiær, ditto ditto.
Vædersö Klit, rocket apparatus.
South Lynvig, life-boat and rocket apparatus.
Nyminde Gab, rocket apparatus.
Henne Strand, ditto.
Blaavand Point, life-boat and rocket apparatus.

former, and between them there is a depth of 4 fathoms, and even more. In the summer season, the water-stand being always less than during the winter, the ridges draw nearer to the beach. In gales of wind from the sea the waves break across all, but less violently in such places where a flat extends to some distance outside, and in such places it might be practicable to vessels, caught on a lee shore, to bring up between the ridges, immediately after having passed the outer one, and thus having a chance, though a precarious one, of riding out the gale. On account of this, large vessels well provided with ground tackle, and chain cables of sufficient length, should prefer to try and bring up outside the ridges, sufficiently far out to veer 100 to 150 fathoms of the chain without being in the surf; by doing which, it is possible that the vessel might ride it out, even without cutting away her masts.

Skudders.

904. The flat-bottomed vessel, commonly used on this coast, is called a "Skudder" (a kind of smack). During the summer season these skudders anchor inside the shelves, and are hauled on shore when boisterous weather renders it necessary; for this reason the anchorage is chosen off such places where the shore is gradually sloping, as for instance between Skiveren and Asdal. When not able to ride out the gale, the hatches are battened down, and, with her broadside to the wind, the vessel is thrown ashore by the surf; but it is indispensably necessary to have a sufficiently strong hawser or cable made fast on shore, to prevent the vessel being carried off by the reflux of the surf.

905. This coast may be divided into two parts, that facing the Sleeve, from the Skagen to Hanstholm, the north-west point of Jutland, and that facing the North Sea, from Hanstholm to Blaavands Point.

The former is again divided by Hirtshals Point, or Ness, into the two bays, Tannis and Jammer.

Current.

In these bays the rising and falling of the water is inconsiderable, and the current near the shore follows the direction of the wind; but farther out in deep water it commonly runs in an E.N.E. direction, as has been mentioned before (Art. 6), except in easterly gales, when it occasionly runs to the westward.

Tides.

906. The time of high water at full and change at the Skagen is 6 A.M., and at Hirtshals Point 4·30 A.M., but the difference between high and low water is scarcely a foot.

Soundings. 907. As indicated in the chart, soundings are to be had along this coast until nearly in the middle of the Sleeve; in the offing mud and sleek, and towards the coast of Jutland fine sand, whereas towards the coast of Norway there is a depth of several hundred fathoms; these soundings accordingly afford good guidance during foggy or thick weather. The depth gradually decreases on approaching the shore of Jutland, except abreast of Hirtshals Point, where there is a deep indent in the bank, so that at the distance of 16 miles from the point the ground rises to within 17 or 20 fathoms of the surface, though nearer to the shore may be found 30 fathoms.

908. Off Hirtshals Point a flat extends to the distance of about 6 miles, with several shallow spots on it, though none with less than 4 fathoms, and the innermost is only a mile from the point; hence, from the irregularity of the depth, no large vessel ought to approach that point within 4 miles.

Rödground. From 10 to 11 miles to the westward of Hirtshals Point, abreast of the high land Rubierg, lie two shallow patches: the Rödground, bearing N.W. ¼ W. from the conspicuous church of Venneberg, and 3 miles from the shore, with an extent of 1 to 1½ miles, and a depth of 3½ fathoms, rocky bottom; the other shoal, *Bakken Bank.* the Bakken, lies N.W. by W. ¼ W. from the same church, distant 4½ miles from the shore, and with 4½ fathoms on its shoalest part. Saltum Church in one with the inner side of the houses at Lökken leads inside the Rödground when coming from the northward, and Ingstrup church kept close outside of Lökken leads between the two shoals in 7 to 8 fathoms. Neither of these churches has a steeple.

909. N.W. and N.W. by N. from Bulbierg, more than a *Bragerne Shoals.* mile from the shore, there are two shoals, called the Bragerne, with 8 to 11 feet on their shoalest parts, and inside of them a narrow and crooked channel with a depth of 4 to 5 fathoms; but to pass to the northward of them, the Hengelbierg hills, two conspicuous hummocks on the Svinklöv, together with a third and smaller one, should be visible to the northward of Bulbierg. If these hummocks are not visible, you must not stand nearer to the shore than 4 miles, nor in a less depth than 9 to 10 fathoms.

Vester Hog Bank. To the N.N.E., distant 2 miles from Bulbierg, lies a small bank, called the Vester Hog, with 6¾ fathoms on its shoalest part. The marks for which are, Leerup Church in one with Leerup valley,

and Bierget mill, together with a conspicuous hill adjacent to the mill visible to the westward of Bulbierg, and close outside of Skareklit, a sandy cliff detached from Bulbierg.

910. The most remarkable objects on this shore near Hirtshals Point are Löibierg, a hill of moderate height, and flat on its upper part, on which stands Horne Church and mill; and the high land of Rubierg, consisting of sand-downs, and distant 10 miles to the westward of Hirtshals Point. It is rendered the more distinguishable by Venneberg Church, the breadth of which appears augmented by an adjacent small round hillock to the westward of it; the hillock is in one with the church when bearing E. ¼ N. To the southward of Rubierg stands the large mansion of the Börglum Kloster estate, with the contiguous church. Amongst the sand-downs on the shore, the Svinklöv is one of the most remarkable, being high, steep, and flat on the top. Bulbierg Bluff projects between Svinklöv and Hanstholm, and forms with the latter the small bay of Vigsö. This bluff promontory is about 360 feet high; it is excavated by the sea, and a part of it, the Skareklit, which is worn away from the cliff, is about 60 feet high, and lies 40 fathoms outside of the point. To the S.W. of Bulbierg stands Bierget mill, on a pretty high hill, and surrounded by several houses; and behind is the remarkable high land of Kaase Knude, steep on its west side, and containing some villages and Hiardemaal Church, with its high steeple. Finally, Hanstholm appears like several hummocks or islands, which it probably has been of yore. The remarkable objects on Hanstholm are the church, without any turret; the lighthouse, 62 feet high and 80 yards from the church; and some farm-houses, called Hedegaarde, in an elevated situation, and equidistant from each other. The extreme point of Hanstholm is called Roshage.

Rubierg.

Bulbierg Bluff.

Hanstholm.

911. During the last war, the corn trade was carried on from several places on this part of the coast, particularly from Lökken and Vigsö, but at present from Lökken only. The village of Lökken, inhabited by fishermen, stands near the beach, to the south-westward of Rubierg, abreast of Börglum Kloster, and communicates with the town of Hiörring by a good road. The outermost ridge here carries 15 feet water, and lies 3 cables' lengths from the beach, but between it and the next ridge there are 1¼ cables' lengths, and a depth of 3 fathoms, which might

Shipping Places.

possibly allow small craft to ride out a gale, by veering to a whole cable. The exportation is principally made to Norway and but rarely to the Elbe or to England.

Stopping Places.

912. Having mentioned before the circumspection which is necessary on approaching this dangerous coast, our view in mentioning the quality of the anchorages is solely to give the most essential directions to those who, by stress of weather or other circumstances, might be obliged to resort to one or other of the stopping-places. This is most likely to happen in Tannis Bay, between the Skagen and Hirtshals, where ships bound for the Kattegat and the Baltic will find good shelter with south-east and southerly winds. Abreast of Gammel Skagen (Old Scaw) there are 10 to 12 fathoms water, and a sandy bottom: in anchoring there it should be borne in mind that the ground is very steep-to. Midway in the bay, abreast of the Skiveren houses near the beach, you may anchor 5 or 6 miles off-shore, on a sandy bank, with 9 to 10 fathoms water: inside of this bank the water is deeper; and though the holding-ground is indifferent at this anchorage, it is convenient to start from. Abreast of some houses called Kiul, 2 miles to the eastward of Hirtshals Point, there is anchorage in 5 to 9 fathoms, and 1 to 2 miles off: the best berth will be found by standing towards the shore, with the Hellehöie hills in one with Asdal, a mansion in an elevated position, and when, being in 9 fathoms, the northern-most house in Kiul is to be brought in one with Asdal: on which mark the shore is to be approached within a mile, and there you may anchor in 5 fathoms and be sheltered against winds from S.E. to S.W. You might anchor on either side of Hirtshals Point; but, as mentioned before, the depths are irregular and the bottom foul. It may be further observed, that the shallow along that part of the shore between Skiveren and Asdal shoals very gradually; on account of which, flat-bottomed vessels might be run aground there with some degree of safety.

Tannis Bay.

Jammer Bay.

913. In the extensive Bay of Jammer between Hirtshals and Bulbierg it is seldom necessary to anchor, as Lökken is the only shipping-place. Besides, all along the shore between Hirtshals and Lökken there are rocks, with the exception of a spot off Lönstrup, where small vessels may anchor in 3¼ fathoms water, on a clean bottom of sand, with the magazine in one with the middle of Lönstrup rivulet, and so far out that only the roof of

Venneberg Church is visible above the land from the vessel's deck. Finally, with winds off shore you might anchor to the eastward of Bulbierg, at a distance of 5 to 7 miles from the shore, with Thorup Strand houses bearing S.S.W. or S.W. by S., on which mark the depth of 4 fathoms is still found only a mile from the beach. The bottom here is gray sand. Yet it should be observed that the only place in this bay where a boat may land and conveniently procure water is at the mouth of the Aastrup rivulet, distant a mile to the south-west of Hirtshals Point.

914. In the small Bay of Vigsö, between Bulbierg and Hanstholm, there is a clean sandy bottom, whereas rocks are found round Bulbierg as also round Hanstholm, and off the latter even pretty far out. A vessel might anchor in this bay in a convenient depth and distance from the shore, as at a mile off there is still a depth of 4 fathoms. Before the North Sea broke through the isthmus at Agger, some produce was shipped from the adjacent small town of Thisted. *Vigsö Bay.*

915. Hanstholm lens light is a Revolving one of the second order. It is eclipsed every half-minute, and owing to its height, 218 feet above the level of the sea, it may be seen 18 miles in clear weather. It is erected on the point separating the North Sea and the Sleeve or Skagerrak, and to enable vessels, when circumstances will admit, as for instance with southerly or westerly winds, to make the shore of Jutland, instead of, as formerly, the coast of Norway, and thus to take advantage of the easterly current running along the shore of Jutland. However, during the boisterous season, it would probably be prudent still to follow the old rule, and, with all winds to the westward of south, to make Oxö light, off Christiansand in Norway. But, during the summer season, and at all times with southerly winds, vessels may, and with all easterly winds even ought to, make Hanstholm, it being the most direct and shortest way when coming from the southern part of the North Sea and bound to the Kattegat. However, the most minute attention is to be paid to the soundings, as by using the lead every possibility of taking the Oxö and Hanstholm lights, the one for the other, is out of the question, as the lead will show which light it is. *Hanstholm Light.*

916. The coast facing the North Sea, from Hanstholm to Blaavands Point, has altogether the same character as that already described, and is, as above-mentioned, encumbered by *North Sea Coast.*

two sand-ridges along the shore—however, in some places by only one; but it possesses one important difference, in the mouths of three friths or fiords, viz., Liim Fiord, Nissum Fiord, and Ringkiobing Fiord, each of which is able to admit small vessels. But with regard to large vessels, this part of the coast is as repulsive as the former, and even more so, on account of *Horn Reefs.* the fatally-renowned Horn Reefs, one of the most extensive and dangerous groups existing, on account of which this part of the coast is but rarely seen from a large vessel, at least intentionally.

917. From Hanstholm to Agger Minde, the estuary of the Liim Fiord, the direction of the coast is about S.W. for a distance of 26 miles, consisting chiefly of large sand-downs, which hide the land within them, except when seen from a vessel about 4 miles off.* This land behind the sand-downs, is, however, hilly, and amongst the most remarkable objects are, the Tornbakke, a conical hill, near the beach, and the Galgebierg hills, which, though distant 7 miles from the beach, where the very shallow ridge lies, show as eight different hummocks when abreast of them, some distance to the southward of Steenbierg. Another hill, Blokkenbierg, near the beach, is of a moderate height, but steep towards the beach, and may serve as a good guide when standing in for Agger Minde: the large mansion of Vestervig Kloster may also serve the same purpose. Off Blokkenbierg there are 4 fathoms water at only a cable's length from the beach, and from Blokkenbierg the coast has a more southerly direction, trending nearly S.S.W.

About 6 miles from Roshage, the outermost point of Hans- *Klitmölle.* tholm, is Klitmölle, in a bay formed by Orhage, and at the mouth of a rivulet, from which vessels may water, and through which the lake Vester Vandet discharges its abundant water into the sea. Abreast of Klitmölle, and 4 miles to the southward, is a clean sandy bottom, with a depth of 4 fathoms at the distance of 4 cables' lengths from the beach. If obliged to anchor here, the best spot would be N. ½ E. from a conspicuous farmhouse, standing in an elevated situation on a cluster of hummocks called the Svale Hills.

Agger Minde. 918. About 3 miles to the southward of Blokkenbierg, in 56° 45′ N., the North Sea burst through the isthmus in 1825,

* A Chart of Liim Fiord is preparing.

and formed the Agger Minde estuary, the entrance to Liim Fiord: though similar cuts have been forced through the narrow isthmus by the violence of the waves, and were again filled up by the same cause, this opening at Agger Minde will apparently be permanent. The sea forced its way through in two different places, and formed channels with 7 to 7½ feet water across the two ridges which skirt the coast. It is the northernmost of these inlets that is navigable, but subject to continual change, both in direction and depth; and therefore no vessel should attempt it without having a pilot, the more so as the pilot will have to be paid whether he be employed or not, and will attend when the proper signal is made. On the isthmus to the northward of the mouth of the fiord, where the pilots have a look-out, two wooden beacons are erected, of which the westernmost is moveable, in order to be able to bring the beacons in the direction of the varying channel. Inside the isthmus there is an excellent road, and from thence a crooked passage leads into Liim Fiord, but as variable as the inlet, and in general with less water than on the ridges off the mouth of the fiord. This channel is in several places marked by sticks and beacons with brooms, moved from one place to another, according to the changes of the channel.

Pilots.

Beacons.

The outer ridge is half a mile outside the entrance of the inlet, and 80 to 100 feet across; and half a cable's length inside of it lies the second ridge. The depth on the outer ridge in 1850 was 8 feet, and on the inner 7 feet.

919. To guide vessels into the inlet, two beacons have been erected on the south point, and two others on the northern shore, 800 yards apart, the westernmost of which is moveable as mentioned. The eastern beacon is rigged with a yard, to which are hoisted black tablets to show the depth on the ridges; the middle tablet indicating 4 feet, and every additional one an increase of a foot in the depth. To enter the channel, keep the northern beacons in one (about S.E. by E.), until you have passed the ridges, which will be known by the beacons on the southern point coming in one. Then steer on this latter mark towards the south shore, when an E.S.E. course will lead to the anchorage which is only a little farther in. When it is impossible to enter, a large blue flag is hoisted on the inner beacon. In February 1852, the depth in the inner channel was 5¼ feet, which was the lowest waterstand that had occurred during the last 13 years.

Entering Marks.

Pilots. Pilots are stationed on board a cutter, moored close inside the northern point of the inlet; and provided that it is possible to pass through the surf on the ridges, the pilot attends when a signal is made. Vessels running in and out of the inlet without a pilot pay 16 rbsk. per com. last, beacon-money, but having a pilot either in or out they only pay 8 rbsk.

Tides. 920. Outside the mouth of the fiord the ebb runs S.W., and the flood N. and N.E., being quite contrary to its direction farther out. During settled weather there is a regular tide in the mouth of the fiord, but, when an easterly wind sets in after a continuance of westerly gales, the ebb may run out for a couple of successive days, until the common waterstand is settled, when the tide again makes regularly and changes every six hours. The contrary is the case when westerly winds set in after a continuance of easterly ones. During a gale the tide may attain a velocity of 8 knots.

It is high water at full and change at $4^h\ 9^m$ A.M.; the difference generally between high and low water is 1 foot, but at spring tides 3 feet.

Krik Anchorage. 921. In the bay at Krik there is good anchorage for vessels waiting an opportunity to leave the fiord: they are better sheltered there and not exposed to the violent tide or current in the mouth of the fiord. In making this anchorage you should be careful to avoid the shallow extending to the eastward from Flegbusk, which is perfectly steep-to: the mark to pass outside the shallow is a remarkable high hill, to the eastward of the spot where Agger church formerly stood, kept open to the eastward of Agger village, N.N.W. ½W.; and you are at the outermost spit of the shallow when Vestervig church is in one with a conspicuous green cleft in the white cliff: from hence the course to the anchorage is N. by W., minding not to bring a hillock (to the northward of Krik) more westerly than to be in one with the easternmost house in the village, which is the mark to clear the shallow on the west side of the channel; along the east side there are rocks in 8 or 9 feet water, and at 1 to 1½ cables' lengths from the beach, near the cliff. You may anchor in 9 to 12 feet water, good tough holding-ground, at 1 to 2 cables' lengths from the beach, a little to the eastward of Krik Point.

Nissum Bredning. 922. To the southward of the narrows there are 15 to 24 feet water in Nissum Bredning and Lemvig Fiord. The shallow,

along the west side, between the southern beacon and Tybo Rön, a dry shoal, is steep-to from 10 feet to 3; the mark for the beacon, viz., Vestervig church in one with Kiœrgaard hill, likewise leads well clear of the shallow.

The shallow along the eastern side may be approached by the lead, but you should not stand too near the beach, abreast of Helligsö and Katterup, on account of some large rocks lying 1 to 2 cables' lengths off.

923. In the southern part of the Bredning, near the inlet to the small town of Lemvig, there are some dangerous shoals, of which the north-easternmost, the Rön, consists of sand and rocks, with its south end barely covered, having only from 6 to 12 inches water. It lies E.S.E. ½ E. 1¼ miles from Geller Point, two-thirds of a mile to the northward of the Nissum shore, and extends in a N.N.E. direction 1⅝ miles. *Rön Reef.*

924. Off Kabbel Mill, there is a longish heap of stones, with 6 feet water, and separated from the shallow by a narrow and somewhat deeper passage. From the shallow, in a westerly direction, a rocky neck extends with 5 feet water; and two-thirds of a mile to the eastward of Geller Point there is a small rocky patch on which the least depth is 8 feet. Vessels bound for Lemvig may stand across the flat extending from the north side of the Rön, in 10 feet water, by keeping Törring church in one with a conspicuous hill close to the southward of Dalgaard, until Lemvig Mill is in one with the west side of Biergegaard, on which mark the course is S.S.W. ½ W., passing to the eastward of the small foul patch, until reaching so far in, that Harboöre church approaches towards the north side of Geller Point, when you should keep a little southerly, so as to bring the mill in one with the west side of Lem hills. On this mark you will cross the flat that extends from Geller Point in 10 to 12 feet water, and then the course is W. by S., until the mill is midway between the two inner points in the fiord, when you must steer S. by W. ½ W. direct for the mill, in midchannel, and in 12 to 15 feet water, and anchor abreast of the town in 9 feet, soft bottom with seaweed, 1 to 2 cables' lengths from the beach. *Kabbel Hage.* *Lemvig.*

925. If coming to Lemvig from the eastward to the southward of the Rön, you should steer a little more southerly than W., with Törring Church in one with a remarkable cleft in *Lemvig Harbour.*

the cliff: the church is then at the same time in one with a low hummock to the southward of a farm called Sögaard. This mark is to be followed until Harboöre Church is in one with the northern extremity of Geller Point, when you will be close to the south point of the Rön, which is steep-to, and from thence steer a point more northerly, so as to bring Törring Church in one with Sögaard, in order to avoid the rocky Kabbel Hage, until Lemvig mill becomes visible open of Lem hills, and then follow the directions stated above. When working in you must not stand nearer to the west side of the Rön shoal than just to keep Kabbelgaard fully open of the hill on which Kabbel mill stands. Loading or unloading takes place with prams, as the town has neither pier nor wharf.

Hygum. To the northward of Geller Point there is a small inlet with 12 feet water, in a W.N.W. direction, abreast of Hygum Church, where shelter is found even against northerly winds, by the spit extending from Harboöre with a depth of only 2 to 3 feet, which forms the north side of the bay.

Nissum Shore. 926. Along the shore off Nissum the shallow is extremely steep, with 9 to 12 feet water close to the beach: but on account of some small rocky patches with 6 to 7 feet water, outside of the shallow, no vessel in working along shore here ought to come nearer than to have Hygum Church in one with Nissum Point. The course from the southernmost beacon of the narrows across the Bredning is S.S.E. and S.E. by S. until *Odde Sound.* towards Odde Sound (commonly called Otte Sound), through which it is N.E. by N. with Sändbierg Church midway between both points. The depth in the sound is 5 to 9 fathoms, and the edges are steep-to, particularly on the south side at Grisetaa Point, which may be rounded very closely. Vessels wishing to bring up in the sound may anchor S.W. of the northern Ferry point, off which there is a flat. In a small bay, to the northward of this point, there was formerly a harbour for small craft, but since the irruption of the sea at Agger, in 1825, this harbour has *Ferry.* become useless, being filled with sand. The ferry crosses Odde Sound.

Venö Sound. 927. Past Odde Sound you may proceed through Venö Sound, *Struer.* to the westward of Venö, to the shipping-place Struer. The depth in Venö Sound is 3½ to 5 fathoms, and the shallow is clean on both sides, so as to be approached by the lead, except on the

flat from the north-west point of Venö Island, which is rocky. When working do not stand nearer to the shallow than to have Hindsels farm, on Thyholm, standing close to the beach to the northward of Jegindö, and conspicuous by its broad red-tiled roof, just seen between the two points of Jegindö Sound. The course through Venö Sound is S., towards Venö Point, which should be passed close in 5 to 6 fathoms water, in order to avoid a long, narrow, and shallow neck of sand extending from Adsker, the opposite point, nearly to the middle of the channel, which there is very narrow. From Venö Point the course is W.S.W. into Struer Bay, until a conspicuous hillock, with a hollow in the middle, is in one with the north-easternmost house in the village, on which mark steer S.S.W. ½ W. close to the westward of a neck of sand with seaweed off Vrald Point, which shallow is steep from 10 to 2 feet. The anchorage at Struer is 1 to 2 cables' lengths from the beach, in 9 to 11 feet water. This shipping-place for the town of Holstebro is in a thriving state since the irruption at Agger.

928. Venö Bay is clean everywhere, with a depth of 3 to 4 fathoms, soft bottom, and a gradual shallow all along its beaches. *Venö Bay.*

Close to the westward of the rivulet, off Handbierg, vessels may anchor in 2 fathoms water, 2 cables' lengths off shore; but north and north-westerly winds, blowing right on, produce a rather rough sea. In entering Venö Bay from the northward, and passing to the eastward of the island, attention is required in order to avoid a shallow sandy neck extending in an easterly direction to a distance of half a mile from Bradser Point, by bringing Hvidbierg Church in the island of Mors just in one with the outer steep cliff of Kaas Head before Veibierg Mill is in one with Thors Point, and on this mark steer S. ⅝ W. into the bay, to the eastward of the sandy neck. Along the east side from Kaas Head and to the southward of it, there are rocks near the beach on the shallow. *Handbierg.*

929. Vessels bound to Thisted and coming from the westward should steer E.N.E. ½ E. from Odde Sound, past Louberg Point, until Hindsels is visible midway between both of the points of Jegindö Sound, and keep on that mark N. ½ E. in midchannel into the sound, in a depth of 2½ to 3 fathoms until past the points, which are steep-to; from thence the course will be N. by W. ½ W., until past Skalmer Point, being the western- *Passage W. of Mors Island.*

most point of Jegindö, and then N.N.E. ½ E. with Glomstrup Mill just in one with the point to the northward of Hindsels, keeping in midchannel, where the depth is 15 feet, until past Bastholm Point, when the course is N.E. by E. ½ E. to the southward of a small islet abreast of Hindsels. In the narrow part of Jegindö Sound, between the points, there is a ferry from Jegindö to Thyholm, and another ferry crosses from the north-east point of the island to Hester Point on the island of Mors.

Ferries.

Jegindtap Spit.

930. Vessels passing to the S. and E. of Jegindö should avoid the spit extending from Jegindtap Point, which is rocky and very steep-to on its S.E. side. The mark to pass the south end of this spit in 10 feet water is Nörre Nissum Church just open of Louberg Point; and when on this mark the farm of Kaas and a mill of the same name are in one, you are abreast of the south-eastern end of the spit, and may steer N.N.E. across Kaas Bredning, until Heltborg Church is visible midway between Agerö Bakke, a hillock, and Munkholm Point. On this mark steer N.N.W. ½ W. between Böel Point (off which rocks lie a cable's length from the point), and Hester Point, until so far advanced that Hindsels Mill is in one with the south side of the small islet abreast of Hindsels Farm; then keep a little northerly so as to bring Heltborg Church in one with the south end of Agerö Bakke or hillock, which mark leads close to the eastward of the neck, extending to the eastward from Munkholm Point, and which at its extremity slopes abruptly from 3 to 12 feet: from thence the course is W. ½ N. and W. by N. to the southward of Agerö in 15 to 18 feet water, midchannel, both sides being steep-to. When the sound between Lindholm and Agerö is fully open to view, the course is N. by W. ½ W. midway in the sound in 3 to 4 fathoms water, steep-to on the Lindholm side, but shallow along Agerö and the Steenklip. The last-named mark must be followed until Glomstrup Mill is well open to the northward of the small island Steenklip, when the course is W.N.W. and N. by E., to the southward of Næsöre Point, which may be passed at half a cable's length off in 12 feet water.

Næs Sound.

In the middle of the southern part of Næs Sound there is a small insulated shoal, with large rocks on its south end, with only 4 feet water, and sloping suddenly to 12 feet. You pass to the southward of this shoal, by keeping Hvidbierg Church in Mors just open to the southward of Næsöre Bakke, or hillock; to the

westward of it, with the farm Bodumbisgaard in one with the parsonage, which stands to the southward of the farm-house; and to the eastward of it when the apertures of a stable on the beach are shut to view; when on the shoalest part of this patch, in 4 feet water, these apertures are open. Past this shoal the course is N. by E. ½ E. in 3 to 3½ fathoms water, keeping in midchannel in the sound, until Bodum Church and Mill are in one, bearing N.E., which is the leading mark through the sound, clear of Futterup shallow neck, and across Visby Bredning, between an insulated shoal off Maager Point, more particularly described in the next article, and the neck of sand extending from that point. A ferry is established across Næs Sound. *Ferry.*

931. In Visby Bredning the depth is from 3 to 7 fathoms, and is deepest in its northern part towards Maager Point. The shallow from the shore consists of sand, is pretty broad, and shoals gradually towards either side. In the northern part there is an insulated shoal, mentioned above, lying W.N.W. ½ W. five-sixths of a mile from Maager Point, with 5 feet water on its shoalest part, with Outrup Church in one with the north end of Örndrup Hillock, and Skyum Church just open outside of Gudnæs cliff. When working to the westward of this shoal, do not stand farther to the eastward than still to leave Skyum Church behind the cliff, until being so far to the northward that Outrup Church is visible to the northward and open of Maager Point, when you will be to the northward of the shoal, and may stand to the eastward in 5 to 6 fathoms water. On the above-mentioned mark of Bodum Church and Mill in one, you pass to the eastward of the shoal, midway between it and the rocky neck off Maager Point (Art. 930). Past this neck the course is E.N.E. ½ E. between Skyum Ore and Ravelkiærhage, then N.E. ½ E. midchannel through Vil Sound, until past Örhale Point, when you should steer N. ⅝ E. through the narrows of the sound, where the shallow slopes remarkably sudden, and the deep-water channel lies close along the Ferry Hage, a point on the east side. The depth in Vil Sound is everywhere 4 to 9 fathoms, and both sides are steep-to. The sound is crossed by a ferry.

Visby Bredning.

Five-feet Shoal.

Vil Sound.

Ferry.

When through the sound, the course is N.E. by E. ½ E. in 4 to 6 fathoms, past Smaalands Hage, a neck of sand with rocks not to be approached within the mark: the westernmost mill at

Thisted open outside of the point abreast of Varhöi, then steer N.E. ¾ N. in the direction towards the town of Thisted. The harbour has been recently constructed, and is formed by a mole stretching E.S.E. and N.E. from the beach at the south end of the town.

Thisted Harbour.

Close outside the mouth of the harbour, which is 34 feet wide, there are 10 to 12 feet water, and the harbour is to be dredged out to a depth of 8 feet: the bottom is chalk. You enter the harbour to the eastward of a short neck of the shallow extending from Spids Point by keeping open a narrow lane in the eastern part of the town, and steering N.N.E. until the mouth of the harbour opens, when the course into it is W. by N. Coming from the eastward you may stand towards the shallow from the shore, to the eastward of the town, in 10 feet water, by keeping the western-most mill at Thisted in one with the church. Two pilots reside at Thisted.

Pilots.

Port Charges. Vessels belonging to this place pay 6 rbsk., but others 12 rbsk. per com. last, port dues. It possesses at present 40 vessels of 3 to 28 com. lasts burden, and in the year 1842 the number of vessels reported at the custom-house was 268.

932. In the passages to the westward of Morsö Island will be found the following shipping-places and anchorages.

Skibsted Fiord.

From the deep-water channel between Agerö and Munkholm Point you may proceed to Skibsted Fiord by steering W., changing the course by degrees towards S.W. into a narrow creek with a depth of 10 to 12 feet, and farther in 8 feet, close to the southward of Hundser Point; past this the channel trends N.W., and inside Odgaard Hage it is extremely narrow with a depth of 2 to 4 fathoms, while on either side the verge of the shallows is steep-to and nearly dry. From thence towards the inner part of the Fiord the course is W.N.W., the depth decreasing gradually, and abreast of the farm Skibsted there are only 4 to 5 feet water across the fiord.

Glomstrup Creek.

933. In the Glomstrup creek there is a shipping-place off the Tidsel houses, close inside the neck of the shallow, where small craft may anchor in a narrow gut, with 10 feet water. In the bay between Agerö and Morsö, vessels may anchor in 9 feet, and load off the farm Glomstrup. To make this anchorage steer N. by E. ½ E. to the eastward of Agerö in 2 or 2½ fathoms, until

Hvidbierg Church is in one with Glomstrup windmill, and steer on this mark N.E. ½ E. between the necks of the shallows in 6 to 7 feet water. The holding-ground is indifferent on account of its long seaweed on a soft bottom. There is good anchorage on a clear sandy bottom on the flat off Karby, in the eastern-most part of Visby Bredning; and also on the west side of Visby Bredning, abreast of the rivulet to the northward of Kiestrup, in 14 feet water, 2 to 3 cables' lengths from the beach, where the bottom is also sand. *Karby.* *Kiestrup.*

934. In the bay to the northward of Gudnæs Head there is a loading place. The shallow from the shore should not be approached too near on its south and east sides, as it is rocky; the anchorage is to the eastward of the mill, a cable's length from the beach, in 9 feet water. *Gudnæs.*

935. In Dragstrup Vig the depth is 4 to 6 fathoms, with a shallow which is pretty steep to 12 feet. Anchorages are found all along the shore in this creek, but in entering the shallow around Revelkiœr Hage should not be approached within a cable's length, as farther in there are large rocks. *Dragstrup Vig.*

936. In Vil Sound the water is too deep to anchor; but vessels desirous to stop here may anchor in Rue Vig in 9 feet water, soft bottom, a cable's length to the southward of Robusk Point, off which extends a short neck of sand, which however may be approached by the lead. *Vil Sound.* *Rue Vig.*

On the west side of the sound small craft may stop at Fævig, where the shallow is rather steep-to. *Fœvig.*

937. In Thisted Bredning the depth varies from 3 to 7 fathoms, and is deepest in its western parts in the direction of Vil Sound. The shallows from the shore are tolerably sloping, but small craft, the only ones which can navigate the Liim Fiord, may approach it by the lead, except off a neck of sand with 6 feet water extending in a N.W. direction from Skare Point on Morsö; and being extremely steep-to, no vessel ought to stand nearer towards it than to have Overgaard, a farm in Morsö, well open of the point on the south shore, to the westward of Salgierhöi; the house of Overgaard may be known by an adjacent windmill, the only one visible on this part of the island. *Thisted Bredning.*

In a small bay abreast of Gulderup there is anchorage in 12 feet water, 1 to 2 cables' lengths from the beach. *Gulderup Road.*

938. Before the construction of the harbour at Thisted, vessels

Hoxer Harbour. belonging to this town used to winter in Hoxer Harbour, but this is now seldom resorted to. To make this harbour when coming from the westward, and having passed the neck of sand called Skare Hage, as just directed, you should steer E.N.E. towards Arup Mill, until Bro Mill, standing near the beach at the inner end of Lönnerup Fiord, shows midway between both the points at Hoxer, bearing N.N.W.; keep on this mark in 2 to 3 fathoms water, to the southward of a rocky reef extending from the Rön, a dry shoal, until being near to Hoxer Points; then the channel inclines northerly directly between them in a very narrow gut with 9 feet, where you may anchor abreast of Hoxer village.

Lönnerup Fiord. Farther in the Lönnerup Fiord there are only 1 to 3 feet water on a bottom covered by long seaweed.

Österild Fiord. The depths in Österild Fiord, as also in the bays of Arup and Veslös, are only 1 to 3 feet.

Fegge Sound. 939. Fegge Sound, uniting Thisted and Lögstör Brednings, is in its narrowest part, between Fegge Cliff and Sæbesholm, only two-thirds of a cable's length wide, with a depth of 4 to 10 fathoms and extremely steep shallows with 5 feet water along either side. When coming from the westward, and bound through Fegge Sound, the course after being past Skare Hage is E. by S. in 3 to 4 fathoms water, until Öslös Church just comes open of the cliff N.E. by E.; then keep midchannel in the sound until you have passed the north end of Fegge Rön, which shoal may be approached within 100 feet; when you may steer S.E. by E. ½ E. into Lögstör Bredning. On approaching Fegge Sound from the eastward you should avoid a rocky spit, extending in a S.S.W. direction 1¼ miles from Holm Tange, with 3 to 8 feet water, and

Holm Tange Hage. called Holm Tange Hage, which is passed in 10 feet water by keeping the southernmost point of Fegge Cliff well open of the north end of the hillock at Skaregaard in Morsö, and then you may steer N.W. by W. ½ W. midway between Arup church and mill, until being on the leading mark for the sound, you can steer through it. Vessels coasting along the east side of Morsö, and bound for Fegge Sound, must be careful to avoid a reef, with 3 to 6 feet water, and extending in an easterly direction from Fegge Rön; Skaarup Hill in one with Öslös Church will lead to the eastward of this reef, and it is passed when Arup Mill is well open to the northward of Fegge Rön; then steer N.W. to the northward of this shoal, and

afterwards S.W. by W. through the sound on the above-mentioned mark, Öslös Church just open of the cliff.

940. On the flat off Arup Mill a new road has been formed, the extremity of which is surrounded by piles, and forms a sort of pier-head 4 feet high; from hence a ferry crosses to Fegge Cliff on Morsö. E.N.E. from the pier-head there is anchorage in 9 feet water. Through the narrows of the sound the current is sometimes too strong to work against. *Fegge Ferry.* *Anchorage.* *Current.*

941. In Lögstör Bredning the depth is 3½ to 4 fathoms, with soft bottom, gradually shoaling to the northward towards the bight of Bygholms Veile, and to the eastward towards Lögstör Bar, which consists of sand. The depth in Bygholms Veile is not greater than may be crossed by horse and waggon in an ordinary waterstand. *Lögstör Bredning.*

942. Between Lögstör and Livö Brednings there are several shoals, the northernmost of which, the Rön, is a small dry islet, distant a mile from the beach abreast of Eierslöv hillock in Morsö, and separated from that island by a passage with 4 fathoms water. The north side of the Rön is steep-to, but off its south end a reef extends more than a mile to the southward, having on it large rocks, with only 3 to 5 feet water, even at the distance of two-thirds of a mile from the Rön. To the E. by S. 1¼ miles from this dry shoal, there is a sandbank with 8 feet water on its shoalest part, with the house of Biörnsholm just open to the northward of Livö. Another shoal, the Blind Rön, has a knoll, dry at low water, consisting of sand and stones: this dry patch lies between the north-west point of Livö and Eierslöv Cliff, distant 1½ miles from Livö, with Seierslöv Church in Morsö just in one with the south end of the high and conspicuous Eierslöv Cliff. This shoal is steep-to on its south side from 4 fathoms to 2, but off its north end a long reef extends 1⅝ miles to the northward, with only 3 to 8 water, and fully a mile from the dry spot. Having brought Tödsö Church in Morsö in sight to the southward of Strandgaard hillock, at Buxer Point, steer S.W. by W. ½ W. from Lögstör Bredning to that of Livö: the least depth in this track is 9 feet, across the tail of the reef off the northernmost Rön; but as this mark cannot be depended upon, and as no other is known, you may shape a fair course between the reefs and the bank. Vessels, in working through Bredning, between Livö and Fegge Sound, *Rön Islet.* *Blind Rön.*

ought not to stand more to the southward than to have the house of Biörnsholm well open to the westward of Rönberg Point.

Lögstör to Nykiöbing.

943. Vessels coming from Lögstör Bar, and bound for the town of Nykiöbing in Morsö, should steer W.S.W. across Lögstör Bredning, to the northward of the island of Livö, the north side of which may be approached by the lead, and then S.W. by W. midchannel in 4 to 5 fathoms water, to the southward of the Blind Rön, with the high land in Morsö over Salling Sound just shut in with Knuds Head in the island of Fuur, until having passed the Rön; then keep a point more westerly, in order to pass outside a neck of the shallow off Knuds Head, until you have reached so far in Livö Bredning that Salling Sound is well open, bearing S.W. by S.; and keeping it so, steer towards Ör Point in 4 to 6 fathoms water. The shallow off Morsö, close to the northward of this point, being very steep-to, as it suddenly deepens from 6 to 4 fathoms; and its being also rocky in some parts, vessels working there ought not to stand nearer to that part of the island of Mors than to have the southern extremity of Ör Point just shut in with Glyngör Point in Salling Sound.

Nykiöbing Harbour.

944. When Tödsö and Nykiöbing Churches are in one, the channel turns into the bay only a third of a cable's length from the south end of Ör Point; but having passed the point, the course is N. by E. through a narrow passage with 7 to 12 feet, the deepest water being along its east side, until farther into the bay, abreast of the town of Nykiöbing, where small craft may anchor in 8 to 9 feet water, soft bottom. From this anchorage the inlet to the harbour bends W.N.W. through a narrow cut between two ranges of stakes, which cut is to be dredged out to a depth of 6 to 8 feet. In the small harbour there are bulwarks around it, but only a depth of 4 to 5 feet; improvements are intended by repairing the sea wall on the north side, and by dredging out the rivulet to the northward of the town, so as to afford a berth for small craft in the rivulet.

Kaas to Nykiöbing.

945. Vessels coming from the westward and bound for Nykiöbing, after having passed Jegindtap Point, according to the directions given in Art. 930, should steer E.N.E. across Kaas Bredning in 3½ to 4 fathoms water, until abreast of Sillerslöv Point in Morsö, and then N.E. ½ E. through Salling Sound in 6 to 10 fathoms towards the entrance to Nykiöbing Bay.

At present Nykiöbing possesses 14 vessels, all together amounting to a burden of 141 com. lasts; the fees to be paid are 5 rbsk. per com. last for vessels belonging to the town, and 8 rbsk. for those from other places. *Port Charges.*

946. As mentioned above, Kaas Bredning has a depth of 3½ to 4 fathoms: the shallow along the shore from Hester Point to Sillerslöv Point is but of small extent and consists of sand, but along the south side, round the point abreast of Kaas Wood, the shallow from the shore is pretty wide. Around the point the shallow is rocky, but to the eastward of it, in the bay abreast of Aalbek Mill, is a clean sandy bottom and anchorage on the flat in 12 feet water, at 2 cables' lengths from the beach; however, vessels do not ride safely there with gales of wind from N.E. round by N. to N.W. Between Aalbek Mill and Ny Mill, the shallow shelves suddenly, with rocks near the beach under the high land; but off Ny Mill there is a clean sandy flat, with anchorage in 7 to 9 feet water. Harre Vig is clean, with a depth of 3 to 2½ fathoms in the innermost part of the creek. The course into it is E.S.E. midway between the points, minding to avoid a short rocky reef stretching out from the projecting point on the south side of the creek, by hugging the north side, which is clean, and when having passed the reef steer E. by S. between the points, inside of which there is anchorage in any part. *Kaas Loading-place.* *Ny Mill Anchorage.* *Harre Bay.*

947. Salling Sound has from 6 to 10 fathoms water, and to the northward of Glyngör Point the depth is even more than 16 fathoms. The edges of the narrow shallow are extremely steep on either side. However, when working in this sound, attention should be paid to avoid the shallow off Vil Point, close to the northward of Harre Vig, on account of some rocks, not visible; therefore do not stand farther to the eastward than to have Nykiöbing Church in one with a corn magazine, which stands to the eastward of Salling Sound Ferryhouse on Morsö. There is a ferry between the shore of Salling and the island of Mors. *Salling Sound.* *Ferry.*

With winds from S.E. round by E. to N. the current generally runs to the southward, whereas it runs to the northward through the sound with the winds from S. and W. to N.W., and is frequently too strong to allow a vessel to work through. *Current.*

948. Draaby Vig on the east side of Morsö affords a good anchorage, sheltered against all winds except those from south, which raise a sea in the bay. Vessels making this anchorage *Draaby Vig.*

from the eastward should avoid a spit of sand with 3 to 4 feet water, which juts to the southward from Buxer Point, but which is passed to the southward in 3 fathoms, by keeping a small conspicuous hillock on the island of Fuur well open to the southward of Knuds Head cliff. When on this mark, as Ör Point draws on with Glyngör Point, you will come abreast of the southern point of the spit, and should steer first N.W. and then N. in the direction of South Draaby Church, and then anchor abreast of Jörsby Hage in the innermost part of the creek, in 9 to 12 feet water, soft bottom. The shallow from the shore consists of sand and seaweed. From Buxer Point to the northward towards Fegge Cliff, there are rocks on the shallow along the high land of Morsö, particularly around Eierslöv Point, and from it to the northward until abreast of the low land to the southward of

Anchorage off Fegge Cliff Fegge Cliff, where there is anchorage in 10 feet water, clean sandy bottom, 2 cables' lengths from the beach. Vessels coming from Nykiöbing or Salling Sound, and bound through Fegge Sound, should, from Ör Point, steer N.E. by N. in 3 fathoms water, with Salling Sound well open, until North Arup Church is well open to the eastward of Fegge Cliff, N. by E. ½ E., keeping that mark on until Skaarup Hillock is in one with Öslös Church, and then steer into the sound as directed in Art. 939.

Fuur Island. 949. Along the north side of the island of Fuur the shallow is pretty steep-to, from 2 to 4 fathoms, and this depth is 3 to 4 cables' lengths from the beach, close to which there are large rocks; so that vessels, therefore, turning through the Livö Bredning should not stand into less than 2 fathoms. On the shallow round Knuds Head there are likewise some large rocks, which are passed to the westward when North Arup Church is just open to the eastward of Fegge Cliff. In the small bay on the east side of the island, between Færker and Engelst Points, will be found a clean sandy bottom and a gradually-shelving shallow, on which vessels may anchor and be well sheltered against winds from N. round by W. to S.S.E.

950. On the S.W. side of the island, the extent of the shallow is inconsiderable and steep-to towards Fuur Sound. The best

Pulse Vig. anchorage off this island is in Pulse Vig, the small bay on the south side of the island between Degen Point and the mill. To make Fuur Sound from the westward, and to stand into this anchorage, attention must be paid to avoid a reef extending

from Sæby Point to the N.N.W. You pass clear of it and of the shallow from the shore, when Refshammer hillocks, in Mors Island, are brought in one with the south end of Ör Point, and by steering on this mark E. ¾ N. until Kieldgaard Hill, to the northward of Selde Church, just comes in one with Degen Point, which may be passed 100 to 200 feet off, in a depth of 3 fathoms, and then steer into Pulse Vig, and anchor in 12 feet water, sand and soft bottom, 1 to 2 cables' lengths from the beach. From the point on which the mill stands a ferry crosses to the opposite shore of Salling. *Degen Ferry.*

951. In the easternmost part of Fuur Sound, midchannel, and half a mile to the eastward of the mill, there is a reef nearly dry with rocks on its west end, and perfectly steep-to, whereas to the eastward of it there is shallow water. To avoid this reef, steer from Pulse Vig E. ¼ N. until past the ferry point, and from thence E.S.E. ½ E. with Fuur Mill just to the northward of the southernmost of two houses standing on the ferry point, and thus passing to the southward of the shoal in 3 fathoms, through a narrow channel between the shoal and the shallow from the Salling shore. If desirous to leave the sound by passing to the northward of the shoal, the course is N.E. from the ferry point, until the apertures in Fuur church tower are open, when you should steer E.S.E. out of the sound. The passage between Fuur and the island of Livö is called Favne Deep, and has all through 5 to 6 fathoms and no insulated shoals. The shallow along the west side of Livö is pretty broad and gradually slopes towards deep water on the north side: off the cliff on the west side of the island there are rocks near to the beach. From the east side the shallow is narrow and steep-to; and in a small bay there is anchorage in 9 to 12 feet, tough ground, at 1 to 2 cables' lengths from the beach, with Öslös Church in one with the easternmost point of the island. Off the extremity of the long and narrow spit, called Liv Tap, consisting of sand and pebbles, and dry at low water, a curved reef extends, in the directions of S.S.W., S., and S.S.E., with only 1 to 2 feet water, and of course must be avoided. You pass to the southward of this reef by keeping Fuur Mill in one with the S.E. point of the island of Fuur, and then to the eastward of it, when the houses in Rönberg village are visible outside the high land. To the eastward of Livö there is a clear passage, with 4 fathoms water, and the *Livö Island.* *Liv Tap.*

shallow from the east side of the island is steep-to, but with rocks near the beach.

Biörnsholm Bay. 952. In Biörnsholm Bay there is anchorage on the flat, abreast of the house and of the rivulet, in 9 to 12 feet water, sandy bottom; but round Ertbölle Point there are rocks near the beach.

953. Having passed Fuur Sound and going to the southward to Skive or Hiarbek, steer S. ¼ E. to Sundsör Hage, on the east shore of Salling, the shallow from which slopes suddenly from 4 to 10 feet depth at 1 to 2 cables' lengths from the beach. When turning, an insulated shoal should be avoided, which has only 6 feet water and stones on its shoalest part; it lies just in the track between Junget and Strandby, but a third nearer to the latter, with Fuur Church in one with the north side of Salling Shore: its extent is a mile N. and S. with a depth of 10 feet; you will pass to the eastward of it in 12 feet with Rönberg Point in one with Ertbölle Point.

Riisgaard Bredning. 954. In Riisgaard Bredning there are 4 to 6 fathoms water, soft bottom. Off the north side of Rotholm, in the southern part of the Bredning, a reef, with 1 to 5 feet water, extends two-thirds of a mile to the N.N.W., and is remarkably steep on both sides. You pass to the north and eastward of this reef by keeping Junget Church open to the northward of a conspicuous pointed hill near the beach; and when the ferry-house at Sundsör is well open to the southward of Great Rotholm, steer S.W. ¼ W. The mark to pass midchannel between the reef and the holm is Junget Church in one with a farmhouse to the southward of the hill, bearing N.N.W. Having proceeded so far, on either side of the Rotholm, as to see Grönninggaard House outside of the woody point of Astrup; steer on this mark S.W. by W. ¼ W., passing to the eastward of *Sundsör Hage.* Sundsör Hage, which projects half a mile in a S.E. direction from the ferry-house, and which is steep-to, having a depth of 6 fathoms close to the shallow, on which there are but 4 feet. If this mark should not be visible, a conspicuous hillock, a short distance to the southward of the ferry-house, on the east side, should be kept just midway between Hesselgaard and a small house to the northward of it, which mark clears the spit of Sundsör Hage.

Sundsör. 955. From Sundsör a ferry crosses Hvalp Sound; the landing takes place on either side of the spit, stretching out from Sundsör,

according to the direction of the wind, but the depth close to the shore is only sufficient for row-boats. On the east side of the point, abreast of the ferry-house, there is a short pier, forming a small harbour with 2 to 3 feet water for the ferry, but it is open to the N.N.W. On the mark above mentioned steer S.W. by W. ¾ W. midchannel through Hvalp Sound, in 5 to 7 fathoms; the shallows on either side are steep-to only for a short distance. *Hvalp Sound.*

In Hvalp Sound there is a loading-place off Eskiær; the anchorage is abreast of the mill-stream or rivulet.

On both sides of Sundsör Hage vessels may anchor according to the direction of the wind in 12 to 15 feet water, close to the beach.

On the flat to the southward of the Riisgaarde farms there is anchorage in 12 feet water, sandy bottom, at 2 cables' lengths from the beach.

Having passed Eskiær Wood, steer S.W. into Skive Fiord, close round Grönning Hage, which may be passed in 2 fathoms, about 100 feet off; in order to avoid the spit off Lundö Hage, extending N.W. by W. from the point, and suddenly sloping from 3 feet to 2 fathoms, a very conspicuous hill, near the beach, S.E. from Tise Church, should be brought in one with the outermost point of Grönning Hage, this being the leading mark into Skive Fiord, until near Krabbesholm Wood, when the course is S. by W. ¾ W. along the shallow from the shore, until at some distance to the southward of Krabbesholm; and there you may anchor in 6 to 7 feet water, soft bottom, abreast of a small pier, 1¼ cables' lengths from the beach; there being at the pier-head only a foot water. On account of the shallow bar off the mouth of Skive Rivulet carrying only 2½ feet, and but 4 to 6 feet in the narrow and crooked gut inside the bar, vessels load or unload off the pier, from which a road leads to the town. *Skive Fiord.* *Skive Rivulet.*

956. From Hvalp Sound the course is S.E. between the projecting land of Lundö and Knuds Head into the Eastern Bredning. From Jesse Point a spit of sand, barely covered, projects 3 cables' lengths to the northward; its extremity falling suddenly from a foot to 3 fathoms. A flat-topped hill in Nörgaard Fields brought in one with the woody point near them, clears the spit, when keep a little southerly, so as to bring the hill well open of *Jesse Spit.*

the woody point, in order to pass to the southward of the shallow from Knuds Head, round which are rocks a cable's length off.

East Bredning. In any part of this Bredning there are 3 to 3½ fathoms water, and soft bottom. The shallows along its shores may be approached by the lead, except the Trangmand sand which juts out from the beach near the mouth of Virk Sound, to the distance of a mile, and which, especially on its east side, is steep-to, deepening abruptly from 7 to 15 feet. From Knuds Head the course across the East Bredning is S.E. ¾ E. to the northward of the Trangmand, on the mark of Uldbierg Church in one with a remarkable cleft in Uldbierg Cliff to the northward of Klinthill, until the ferry-house at Virk Sound is well open of the point on the west side of the Sound, and then steer on this mark S. by W. into the sound. Towards the narrows of Virk Sound the depth increases to 4 and 4½ fathoms, and the shallows on either side are steep-to, deepening from 4 to 12 feet water. In working in, do not stand nearer to Uldbierg Cliff than to have Torup Church in one with the middle of the ferry-house; and off the west side, tack, when the ferry-house is run behind Sundhagen Point. Both of the points may be approached closely.

Trangmand Sandbank.

Virk Sound. Narrows.

Hiarbek Fiord 957. The course from the ferry-point is S.S.W. ¾ W. into Hiarbek Fiord, the shallows of which are steep-to on the east side, and should not be approached nearer than to have Giedsted Church in one with the east side of the ferry-house: the shallow on the west side, from its shoaling gradually, may be approached by the lead. Farther to the southward in the fiord the depth decreases to 10 and 12 feet; and, having passed Örum Church, the course changes gradually to S. and then S.E. ¾ S. until Vorde Church is in one with a remarkable hollow or cleft in Vorde Hill: this mark leads in 8 to 9 feet water to the eastward of a bank of sand, with 2 to 4 feet water, extending half a mile N.E. from Qvols Hage, and is passed when the fourth hill from the southward of the Seiers Hills is in one with the south-east end of Lynderup Wood. On this mark steer S.W. by W. and anchor off Hiarbek Village in 8 to 9 feet water, a cable's length from the beach, where a wooden pier facilitates loading or unloading with small boats. Hiarbek is the loading-place for the adjacent town of Viborg, where the custom-house is. In the southernmost part of the fiord, towards

Hiarbek.

Viborg.

the mouth of Skals Rivulet, there are 4 to 9 feet water, soft bottom.

958. In Virk Sound, as well as in Hvalp Sound, the current runs at the rate of 1 to 2 knots; and during fresh N.W. winds, with still greater velocity, especially in the narrows of the sounds. *Current.*

959. Vessels coming from Hiarbek or Skive and bound to Lögstör must avoid Lemdrup Rön, a rocky patch, just covered at low water, to the north-west of Lemdrup hills, and 4 cables' lengths from the beach. With Ornehöi house open to the northward of the town of Lögstör, you pass to the westward of these rocks. *Lemdrup Rön.*

960. The bar, which extends 2 miles to the westward of Lögstör, and separates the deep-water sound inside of Lögstör from the Bredning, is, on account of its shallow water, only 3 to 4 feet, a great impediment to navigation between the western part of Liim Fiord and the city of Aalborg, and also to the passage through the fiord. The bottom consists of loose sand, and consequently the channel is not only subject to frequent changes, particularly with westerly gales, but all the attempts to procure a greater depth by raking or dredging, which were undertaken in the year 1843, proved unsuccessful. Small craft drawing more than 3½ feet cannot pass the bar without discharging part of their cargo into lighters; and when coming from the westward they are obliged to anchor outside the bar in 12 feet water, where, with westerly winds, they are exposed to a rough sea in the Bredning. The breadth of the bar is 3 cables' lengths, and the deepest channel across it is pointed out by two poles (one, the outer, carrying a flag), which stand on the mark of Næsborg Church in one with the northernmost house to the northward of Smak Mill. This is the leading mark for the beacon, and from thence E. ¼ S. should be steered across the bar, to the southward of the second beacon, which carries a broom and an arm on its top, and stands in 6 feet water inside the bar; the shoalest part of the bar being about half way between the two beacons, with Malle Church in one with a hillock in Lemdrup field. *Lögstör Bar.*

Inside of the bar there are two more poles, but standing on the north side of the passage; you are therefore to leave them on the port side, and to steer E. by S. and S.E. by E.,

until past the last beacon, when the course will be E. ¼ S. into the inlet of Lögstör, in 15 to 24 feet water, but the inlet is only a cable's length wide, and the shallows on either side steep-to, and nearly dry. Along the north side of the town there are quays and several small harbours for boats. The best anchorage is midchannel, with a hawser made fast to the shore to prevent the anchor from getting foul by the changing of the current, which at times runs 2 to 3 knots: during continued gales from the eastward it runs to the westward, and during westerly winds in a contrary direction. The waterstand at Lögstör depends on the wind: during a continuance of settled weather, a regular ebb and flood is perceptible, though the rise and fall of the water is only 3 inches, and the current does not change its direction. From Lögstör a ferry crosses to Ferryholm, a small island on the outer verge of the extensive shallow from the northern shore of the sound; at Aggersborg, 2 miles to the eastward of Lögstör, there is also a ferry across Agger Sound.

Lögstör Harbour.

Current.

Ferries.

Agger Sound.

961. The course through the narrow and deep sound to the eastward of Lögstör is East, N.E. by N. and E.N.E.: the shallows along either side are remarkably steep-to as far as the Agger Sound farms; and from thence the course is E. to the Svælget a distance of 1¾ miles to the eastward of Agger Sound. The western pole or beacon there stands in the line of the steep west side of the first remarkable hillock to the westward of Marbierg, midway between Aistrup Church and a lonely house. From this beacon a channel leads in an easterly direction, between the South Meil Ground (called Galehage or Hagen), with 1 to 4 feet water on it, and the North Meil Ground. This channel, which in 1843 had a depth of 4 to 5 feet only, has now 6 to 7 feet, and has been pointed out by a pole on the S.E. end of the North Meil Ground; along the south side of this channel are 5 poles, the outermost of which stands on the east end of the North Meil Ground. The Svælget, which formerly was more frequented, trends in a S.E. direction, but its depth is decreased to 4 or 5 feet. From the western pole or beacon, the course is S.E. through the Svælget, leaving the beacon on the port side, and keeping in the above-mentioned mark for the beacon to the next one, which stands on the south side and carries two brooms; when it is passed, steer E. ¼ S., in 3½ to 4 fathoms, along the steep-to shallow, towards the west

Svælget.

point of the Middle Ground, which extends to the W. by N. more than 1¾ miles from the Trolleholms, with a depth of only 1 to 5 feet, and marked by a pole on its western extremity. When Blushöi, north of Attrup, is in one with a remarkable hollow on the hummock close to the southward of that hill, you are at the western spit of the Middle Ground, and may on this mark stand across it, in 9 feet water, into a small channel, with 7 to 8 feet water, leading to the northward of the shoal in an easterly direction, past Attrup; but there it becomes dry between the small sandholms. The common track is to the southward of the Middle Ground by steering E.S.E. ½ E. from the above-mentioned mark for the western spit, to Hage Deep, which is rendered very narrow by a sandbank, named Storkhals, that extends from the south side, and the Normandshage, a barely covered shoal, on the north side, to the southward of Trelleholm, from which it is separated by a passage with 9 feet water, though never used. On the N.W. edge of Storkhals stands a pole, and one also on the south side of the Normandshage. When Vaar Mill is just in one with the west side of Vaar Wood, you are at the spit of Storkhals in 10 feet water, and may steer S.E. by E. ½ E. through the Hage Deep, until Voxlev and Nibe Churches are in one; then steer E. ½ S. between the Mellemground Holms on the north side and Vaar and Kyö Holms on the south side, and stand farther in between the Skulehage on the south side, and the Olandhage on the north side, both of which are marked by poles, until at the narrow Draget which is indicated by four beacons on its south side, but which carries 15 feet water. The westernmost beacon stands with Kokkedal Mill in one with the south side of a conspicuous hillock on the south end of Öland; and steer from this beacon through the Draget S.E., so as to leave the beacons to starboard. Having passed the last one, steer E.S.E. until Bislev Church is in one with Koldsminde, a large and conspicuous house at the southern end of the small town of Nibe; then steer N.E. by E. across the flat between Klitgaard and Öland in 7 feet water, until Oxholm Church is visible to the northward of the easternmost mill at Öland, and then the flat is passed. Making the Draget from the eastward, do not stand more westerly than to have Bislev Church in one with Koldsminde, and steer on that mark S.W. by W. across the flat; and when Sönderholm Church comes in one

Middle Ground.

Hage Deep.

The Draget or Narrows.

with the southernmost of the insulated farms to the southward of those called Klitgaard, steer on that mark N.W. ½ W. towards the easternmost beacon.

962. From Klitgaard, if bound to the eastward, steer N.E. by E., changing the course gradually to E. ½ N., between Giöl and Nörholm, in 3 to 4 fathoms; you should keep along the gradually-shoaling shallow off Giöl, on account of Giölhage, a wide bank extending from the south side nearly to midchannel, and leaving a blind passage to the southward of it. When Rödslet Mill is in one with the house on Fruensholm (which mark also leads through the south side of the channel, in 8 feet water, along the bank) you are at the western spit of Giölhage in 10 feet water, and may keep E. by N. midchannel, in 4 to 6 fathoms, close to the small holms off the south-east end of Giöl, until Giöl Church is in one with Isbakke House; from thence the course is E.S.E., until arriving at the first beacon on the Dynen, a narrow, barely-covered shoal, midchannel between Giöl and Egholm, with passages on either side, but the southern one is so narrow as not to be practicable. The westernmost pole or beacon stands on the mark of Aaby Church in one with the east end of Skeelslund, a small grove on the shore to the northward of Giöl: both the middle beacons, the one on the north side and the other on the south side of the shoal, stand on the following mark, the southernmost of the three conspicuous hills of Vesterhöie in one with Nörholm Church: besides these beacons there is another on the east end of the shoal. Through the channel steer S.E. ¾ E., to the northward of the beacons, in 4 fathoms water, between shallows steep-to on both sides; from the last beacon steer S.E. by S. and S.E. midchannel, to the southward of Egholm, in 4 fathoms water, until St. Budolphi Church in the city of Aalborg is in one with the northernmost of two conspicuous hills to the eastward of Aalborg; keeping on this mark E.S.E., you pass to the southward of Egholm Hage, which is steep-to, and may be discerned by the colour of the water; from hence steer E. by N. between Egholm and the shore, changing the course towards S.E. for Aalborg Harbour, through a deep and clear channel, with shallows steep-to on either side.

Dynen Shoal.

Aalborg.

963. In the western part of Nibe Bredning there are only 1 to 2 feet water on the flat, amongst its small holms or islets;

Nibe Bredning.

but along its easternmost shore the bottom is soft, with long seaweed, and 8 to 12 feet water, and deepest along the shallow between Klitgaard houses and the town of Nibe. Vessels bound for Nibe and coming through the Draget should steer S.W. by S. across the Bredning, with Bislev Church in one with Koldsminde, until Giöl Church is in one with the westernmost high house, with red tiles, close to Klitgaard houses; then steer S.W. ½ W. into a narrow inlet, with 7 feet water, and anchor on this mark abreast of the town, but the holding-ground is indifferent owing to the long seaweed. At Koldsminde there is a small harbour for fishing-smacks, but not belonging to the town, at which there is only a sort of pier formed of loose stones, loading and unloading being done with boats. *Nibe Road.*

Nibe has but 12 vessels, altogether amounting to 86 com. lasts. A pilot resides there, who takes vessels to Aalborg and Lögstör. From Nibe road, a narrow inlet with 7 to 9 feet water runs close along the shore in a S.W. direction towards Lundbek, where it inclines W. and again S.W. to Sebber Sound; in which sound there is anchorage in 6 to 7 feet water, but farther to the southward in the bay there are only 1 to 5 feet. *Pilot.* *Sebber Sound.*

964. Ulvegab is a small channel leading in a N.E. direction from the westernmost beacon in the Draget, with a depth gradually decreasing from 18 to 9 feet, abreast of the south-east side of Öland, and dry farther in, between that island and Giöl. *Ulvegab.*

965. From the channel between Aalborg and Egholm you may, by steering N.W. by N. on the mark Aalborg Windmill in one with a small white house on the beach, cross the bar, in 11 feet water, between the east point of Egholm and Lindholm beach; and then N.W. and N.W. by N. will lead into the Nörre Deep, a narrow channel with 15 feet water along the shore. Abreast of Rödslet farm there is anchorage in 10 feet water, with Rödslet Mill well open to the westward of Rödslet farm; farther in towards Giöl this creek dries. *Nörre Deep.*

966. Besides those already mentioned, the following additional beacons have been recently placed in this fiord between Lögstor and Aalborg:—

Beacons.

1 on the east point of the northern Meil Ground.
1 on Galehage, the east point of the southern Meil Ground.
1 on the west end of the Middle Ground.
1 on the west point of the Storkhals.

Beacons. 1 on the southern spit of Normands Hage.

1 on the Skulehage.

1 on the south side of the Draget, at the south-eastern spit of the shallow.

1 on Öland Hage.

1 on Klitgaard Sand.

1 on the south point of Egholm Hage.

Beacon money. 967. By Lögstör pilots, who take vessels through the fiord from Aalborg to Agger Minde, the following charges for the beacons on the Lögstör shallows are made: vessels drawing 4 feet or less pay 4 rbsk., and those drawing more than 4 feet pay 5 rbsk. per com. last. Besides all vessels, not having a pilot from Aalborg, pay 1 rbsk. per last for the poles or beacons in Agger Sound and Klitgaard Drag.

Waterstand. 968. Comparisons with former surveys lead to the supposition that the waterstand in the Liim Fiord, in general, has decreased about 3 feet during the last 150 years.*

Liim Fiord to the Southward. 969. In returning from the above account of the Liim Fiord to the shores of the North Sea, the first remark we have to make is that the low neck of sandy downs which separates them, stretches about 8 miles to the southward of Agger Minde; and that, owing to the refraction, the waters of the fiord are sometimes visible at a considerable distance out to seaward, while the low land of the coast is yet below the horizon.

Harboöre. At Harboöre the shore rises to a moderate height and forms as

Fialtring. far as Fialtring a pretty high and fertile shore, with no sand-downs.

Bovberg. The most conspicuous part of the coast is the hill of Bovberg, 197 feet high, near Trans, 14 to 15 miles to the southward of the Agger Minde, for making which, when coming from the southward, the hill is a good landmark; and is the more easily distinguished by a pillar erected on its summit, and by its being so steep towards the sea as to be excavated by it. Abreast of this headland, at the distance of a mile, the depth is 7 to 8 fathoms, and as far out as 10 fathoms the bottom is clean sand.

970. From Fialtring, and from thence to the southward, the coast is again low, with sand-downs, and Nissum Fiord is only separated from the sea by a narrow, low, sandy, ridge of land,

* The eastern entrance to Liim Fiord from the Kattegat, and directions for proceeding from thence to Aalborg, have been already given in Chapter II., Articles 126 to 133.

through which breaks the mouth of the Thorsminde Fiord. This inlet is subject to frequent changes, and even to be entirely choked during N.W. gales; but whenever such is the case, the passage is immediately cleared by dredging; for, if not done, the superabundant water of the fiord, nourished by its many rivulets, would force their own way out and break through in other places more to the southward. When the inlet is open, the depth is from 4 to 6 feet, and thus admits large fishing-boats belonging to the fiord, and the like small craft. *Thorsminde Fiord.*

971. At full and change it is high water at 3.30 a.m., and the common difference between high and low water is 15 inches. The largest stream that empties its waters into the fiord is the Storaa, which rises in the large plain of Alheden and passes in its course the small town of Holstebro. *Tides.*

972. The entrance to Nissum Fiord is pointed out from seaward by Bövling Church, with a steeple somewhat like that of a moske, to the northward of the entrance, while to the southward of it stands Huusby Church, with a steeple and pyramidal gable. The houses on this neck of land to the northward of Thorsminde, and farther in along the shores of the fiord are the dwellings of the North Sea fishermen. *Nissum Fiord.*

The shore between Nissum and Ringkiöbing Fiords is of moderate height, and the churches are low, except that of Huusby, and all of them have low turrets, and are difficult to distinguish on account of the sand-downs along the beach. The churches on Holmsland, in the north end of Ringkiöbing Fiord, have small pyramidal towers.

973. Holmsland, as also the whole of Ringkiöbing Fiord, is protected from the sea by the long sandy ridge of Nyminde Land, 16 to 20 miles in extent. At different times this ridge has been broken through by the inlet to the fiord, called Nyminde Gab, which is gradually changing its position more to the southward. *Nyminde Gab.*

Among the objects on the sand-downs of Nyminde Land is the remarkable Lille Oles Bierg, in 55° 59′ N. on account of its form having a wide cleft, in the middle of which there is a small knoll; 7 miles farther south is the large farm-house of Berregaard, which in clear weather is visible 8 miles off, and is therefore useful as a landmark in making the Nyminde, which at present is 3½ miles to the southward of the farm. *Lille Oles Bierg.*

Blaabierg. 974. But a still more important landmark for making the Nyminde Gab is Blaabierg, a hill 100 feet high, distant 4 miles to the southward of it. Being to the N. or N.W. of the hill, it has the appearance of the upper part of the roof of a large house. Seen from the westward it appears of some length, highest in the middle, with many hillocks on its southern part, and is more conspicuous at a distance than when near it; from the south-west it appears of an oblong form, with a pointed hillock on its highest part. When seen from a more southerly position it is visible above all the sand-downs, being the highest part of the coast, with three hummocks on its top inclining to the westward; but the hill has no bluish hue, as might be presumed from its name, Blaabierg (blue mountain). Abreast of Huusby, at 12 miles off, the depth is 18 to 19 fathoms, and gradually decreasing towards the shore, which may be approached by the lead as far as the Nyminde Gab. At 8½ to 4 cables' lengths off shore the depth is 4 fathoms; but farther in there are ridges along the coast, from a half to 3 cables' lengths distant, the positions of which, however, are constantly changing.

Nyminde Gab. 975. During the last 35 years the Nyminde Gab has shifted more than a mile to the southward; and therefore it would be useless to give leading marks for entering; its latitude in 1840 was 55° 47′ 32″ N.

976. A vessel, when unacquainted with the localities, should ascertain her position by the objects to the northward or southward of the inlet, and then keep along the coast, until she makes Blaabierg or Bierregaard Farm. To the N.W. of the inlet the soundings are 10 to 16 fathoms, with reddish pebbles and patches of white sand; and in the same direction, 11 to 16 miles off, there are banks with 7 to 9 fathoms water, and a similar reddish bottom, as far as the Horn Reefs; these soundings, therefore, may afford some information and guidance. By cross bearings of Blaabierg and Bierregaard, you may shape a course for the inlet by referring to the chart; and in 5 to 7 fathoms, at 2 miles from the shore, you will probably be *Beacons.* able to see the beacons, consisting of poles, with black boards erected, which are shifted by the pilots as occasion requires. The water shoalens gradually, and you may stand in, by the lead, according to the weather, before making signal for a pilot. In 1845 the sea burst through the ridge of land, 1½ miles to the

northward of the former inlet, and this new channel also moves by degrees to the southward; its direction is S.W., but outside the points on both sides of the inlet it inclines W.N.W. to seaward. The depth is reported to be 5 feet, with a common waterstand. The present depths on the shoals into the fiord are—the Tolvtor 5 to 5½ feet, the Lods Ground 4½ feet, the South Pampus 4½ feet, and on the Knoll, and the North Pampus 3 to 4 feet.

The bar is distant about 3 cables' lengths from the beach, and the usual depth is 5½ feet on its shoalest part; the leading mark for the inlet is the beacons in one, and 4 small buoys point out the channel. *Buoys.*

977. It is high water on full and change days at 2h. 45min., and the average rise about 2 feet. Westerly winds cause a greater rise, and with a succession of gales from that quarter a current is continually running in; the contrary is the case when easterly winds prevail. It requires a flood tide to enter, though the stream is not too strong for a vessel to stem, when favoured by a gentle breeze. *Tides and Current.*

978. The pilot is bound to attend outside the sand-ridges: if prevented by a high sea from coming alongside, he leads the way by keeping ahead. When a vessel wishes to know the depth in the inlet, the colours should be hauled down, and this signal is then answered by the pilot by hoisting a flag as many times as the depth is in feet; but if the depth be insufficient to admit vessels, no flag is hoisted on shore. *Pilots.* *Signals for the Waterstand.*

979. The shoalest place in Ringkiöbing Fiord is to the northward of the pilot-house, on the Knoll, on which, as above stated, with a common high water there are only 3 to 4 feet, and the same depth on the north Pampus: in consequence of which lighters are employed to carry part of the cargo across these shoals. The navigation in this fiord is so tortuous and intricate, that a pilot is necessary, though the different channels are pointed out by poles. *Ringkiöbing Fiord.*

Beacon money is paid by all vessels not taking a pilot: vessels of a less burthen than 6 com. lasts pay 24 rbsk., those from 6 to 12 pay 48 rbsk., and those of more than 12 lasts pay 64 rbsk. *Beacon Charges.*

980. Off Blaabierg, vessels may find some shelter with winds from N.E. to S.S.W., according to the distance from the beach. In making this anchorage, bear in mind that the depth from *Blaabierg Anchorage.*

8 to 4 miles gradually decreases towards the shore, and may be approached by the lead. From Nyminde Gab to 4 miles to the southward of Blaabierg there are 4 fathoms at a distance of 8 to 12 cables' lengths from the beach; the outer ridge of sand is about 3 to 5 cables' lengths off, with a depth of 2 to 3 fathoms, and on the inner ridge, at 1 to 2 cables' lengths from the beach, there are generally 4 feet at low water.

Horn Reefs. 981. The dangerous Horn Reefs, the outer 5 fathoms depth of which is 15 miles W.N.W. of Blaavand Point, the western elbow of Jutland; it consists of several banks, on the shoalest part of which there are 8 feet at low water; and therefore small craft of less draught may keep along the coast, as shown by the chart, without attending minutely to the following directions for larger vessels.*

When coming alongshore from the northward, you should keep in 18 fathoms, in order to pass outside the reefs, near which there are 12 to 15 fathoms. The quality of the soundings is important: if mixed with transparent white pebbles, you are close to the westward or southward of the reef, and ought not to stand in to shoaler water. Being to the northward of the reef, at the least 4 miles from the shore, with Blaabierg bearing S.E., you should make good a W. by S. course, in order to be 20 to 24 miles distant from Blaavand Point when the latter bears E. $\frac{1}{2}$ S. Particular attention should also be paid to the direction of the current, and at all events do not stand nearer the reefs than in to 7 or 6 fathoms; and when W. $\frac{1}{2}$ N. from the point and bound for Fanö, do not incline more to the southward and eastward than to be in 10 fathoms on rounding the exterior of the reefs.

982. To pass outside those reefs when coming from the southward, the vessel's position should be ascertained by bearings of the islands, particularly of Fanö, the south end of which may be known by its two beacons, the northern one being the highest and shaped as represented in the chart. Farther to the northward, the beacons on the north end of the island will be seen, together with Fanö mills, and also Jerne church in Jutland, standing on a very elevated position, which in clear weather may be seen over the island of Fanö, 16 miles, or in the vicinity of the Cancer shoal. When about 24 miles from the south point

* See Chart of Helgoland Bight.

of Fanö, steer W.N.W. or N.W. by W., until due south from the S.W. extremity of the reef, minding to allow for the set of the current, and do not go into less than 10 fathoms. Then steer N.N.W. or N.W. by N. 16 miles, until due south from the west end of the reefs, without shoaling your water; and when you round the reefs by keeping more to the northward and eastward, do not go within a depth of 7 fathoms.

983. Vessels desirous of passing through the channel, between the reefs, should bear in mind that they are divided into two principal parts, the inner and the outer reef, by a channel called the West Sluge, or Nordman Deep; and each of these divisions consists of several shoals and shallow patches. Bovberg Knob, with 8 to 12 feet water on its shoalest part, may be considered as a part of the inner reef, though separated from it by Ringkiöbing Deep, and from the outer reef by the West Sluge. Immediately to the westward of the knob there is a long shelf on which the depth is 4 fathoms, and to the eastward of it in Ringkiöbing Deep, there are several patches with 21 and 23 feet water, and but in few places a depth of 6 fathoms.

Sluge Channel. *Bovberg Knob.* *Ringkiöbing Deep.* *Shelf.*

984. The shallow off Blaavand Point, which is about 50 feet high, extends only 2 miles, but forms, in the directions of W.S.W. and S.W. by W., a spit called the Ulv (wolf), which stretches out to the distance of 3½ miles, in 3 fathoms: between this spit and Bovberg Knob lies the Ringkiöbing Deep. Ulv Spit shoals gradually, and may be approached by the lead in a convenient depth.

Blaavand Point. *Ulv Spit.*

985. In the Sluge Channel there are three patches equally embarrassing to its own navigation and to that of the Ringkiöbing Channel, viz. the Cancer, with 3 fathoms; the Knob, with 22 feet; and the Hiörnet, with 15 feet water. These shoals lie between W.S.W. and S.W. by S., and between 4 and 4½ miles from the point.

Cancer, Knob, and Hiörnet.

986. The Outer Horn Reef consists of an extensive and very irregular bank, with 2 to 4 fathoms water, except on certain patches, such as the Munk, with 11 feet about the middle of the bank; the Vyl, with 16 feet; the Tuxen, with 9 feet; the Vovov, with 15 feet; and the Pulle, with 12 feet water. Still farther to the northward there are other banks, on which the sea breaks with westerly gales: such are the Knold with 6½, and the Veiers with nearly 5 fathoms water, reddish bottom.

Outer Horn. *Munk, Vyl, Tuxen, Vovov, and Pulle Patches.* *Knold and Veiers Banks.*

Passage across the Reef. 987. From abreast of Blaabierg, at 4 to 5 miles off, in 8 to 9 fathoms water, the course alongshore is S.W. ¼ W., keeping in the same depth or somewhat less; and in order not to come too near Bovberg Knob, a constant use of the lead is requisite. On this course, when Blaavand Point, which is about 52 feet above the sea, bears E. ¼ S., and you have the depth of 10 to 11 fathoms in the Western Sluge, steer S. E. ¼ E. in order to pass between Bovberg Knob and the Ulv on the one side, and Hiörnet, Knob, and Cancer on the other side. The shallows along the east side of this channel are not so steep-to as on the west side. When Blaavand Point bears N.N.E. ¾ E. you are past the Cancer, and may proceed to the southward.

Sluge Channel from the Northward.

988. From abreast of Blaabierg you may coast along the shallow in 4 fathoms, by steering a south-westerly course until getting into 5 to 6 fathoms in Ringkiöbing Deep. The hill Ringebierg is about 8 miles to the southward of Blaabierg, pretty near the shore, and, when seen from the northward or southward, its north-west point appears the highest, and sloping towards the eastward; from abreast of Blaabierg, it cannot be distinguished from the adjacent land farther south, and is not much higher. By cross bearings of this hill and Blaabierg, you may ascertain when you are at the north end of Ringkiöbing Deep; and when there, keep along the shallow of Ulv Spit, or Bovberg Knob, according to the direction of the wind. You should not keep more westerly in this Deep than in 4 fathoms, as the east side of Bovberg Knob is steep-to, whereas along the shore it gradually shoals up to 3 fathoms. The depth in this channel is irregular, with 5 or 6 fathoms, and some patches with 3½ fathoms, as mentioned above. Having advanced so far that the depth increases to 11 fathoms and more, you are in the Sluge, and should steer S.E. by E. between the Cancer and the shallow from the shore. When Blaavand Point bears N.E. by N. the Cancer is passed.

Ringebierg.

Ringkiöbing Deep from the Northward;

from the Southward. 989. To enter Ringkiöbing Deep from the southward, the vessel's position should be ascertained by bearings of Fanö: and when 4 to 6 miles from that island, steer for Blaavand Point, which, together with Oxby church, may be seen about 8 miles in clear weather. The most remarkable sand-downs are Dafsted and Krog Sands, being higher than the rest, and with steep sides towards the east and west. When Blaavand Point bears

about N.E., steer N.W. along the Ulv in 3 to 5 fathoms water, until the point bears N.E. by N.; then steer W. until the depth increases to 10 fathoms in the Sluge Channel; and then N.N.E., which is the course nearly through the Ringkiöbing Channel; constantly using the lead, to know on which side of the channel the vessel is. When by cross bearings of Blaabierg and Ringebierg you can ascertain that the channel is clear, and being in 6 to 7 fathoms water, keep N.E. by N. alongshore, until abreast of Blaabierg, and from hence you may shape a course as convenient.

Nordmands Deep from Southward.

990. To enter the Sluge or Nordmands Deep from the southward, you should stand towards the shallow to the southward of Blaavand Point, and then keep along it until getting in deep water in the Sluge Channel, when the course will be W.N.W. till past Bovberg Knob, and then more northerly according to your destination.

Tidal Streams.

991. On the Horn Reefs, and to the northward and southward, between Nyminde Gab and Skalling Peninsula, a regular tide exists, changing every six hours, though much influenced by the direction and force of the wind; with gales from N.W. and N. the stream of flood runs longer and with greater velocity, and this, with S.E. and S. gales, is likewise the case with the ebb. The flood runs to the southward, and the ebb to the northward, through the channels across the reef, and generally at the rate of 1 or 1½ knots. The stream follows the trend of the shore, and accordingly to the southward of Blaavand Point the flood runs S.S.E. and the ebb N.N.W. High water takes place at full and change at Blaavand Point at 1.45 a.m.; but outside on the reef it is said to be at midnight. The rise is 7¼ feet at the springs; but it is greatly influenced by the state of the weather: thus gales from seaward produce a higher waterstand, and the contrary when they blow off shore.

Tides.

CHAPTER XIV.

FROM THE HORN REEFS TO THE ELBE.

Horn Reefs to the Southward.

992. THE coast between the Horn Reefs and the Elbe is in every respect different from that described, as the greatest portion of it consists of low marshy ground, enclosed by dikes, and outside sheltered by a range of islands and sand-banks, and surrounded by extensive shallow flats, which partly dry at low water, leaving narrow but deep-water channels between them. Such is the character of this part of the coast; and therefore a knowledge of the tides being of the utmost importance to its navigation, the description and directions which we now are about to give are the more valuable as they are the first authentic documents ever published of the greatest part of these shores.

993. To avoid repetitions, the following arrangements have been generally adopted on this part of the coast.

Remarks on the Buoys and Beacons.

First. The outer buoy in general is of a different colour in each of the various inlets where buoys are placed. The black buoys and floating beacons, which carry brooms, are to be left on the starboard side, and the white buoys and floating beacons, carrying baskets, on the port side.

Secondly. With regard to the large beacons, called steeple-beacons, standing in the channels between the flats, the same rule has been adopted.

The small beacons or poles standing in the Vats (channels navigable only at high water) are placed on the west side, and accordingly are to be left on the port side when coming from the southward, and to starboard when coming from the northward, if not otherwise directed. The first and the last of these beacons carry two horizontal brooms, to distinguish them from the rest.

Thirdly. The buoys are placed on the 1st of March and removed on the 15th of November, unless compelled to deviate from this rule by ice or stormy weather. Where buoys are kept out during the winter, they are marked with brooms or baskets,

like the floating beacons, to point out the different sides of the channels.

Fourthly. No branch pilots are established on this coast, except those at the mouth of the river Eider, who are bound to take vessels to the Hever also; but it is usual for fishermen from Fanö to take charge of vessels bound to all places in its vicinity, and they attend when the proper signal is made off Graa Deep.

Fifthly. The depths given in the chart are those at an ordinary low water. The rise of the tide increases in going to the southward, towards the bight of Helgoland. The time and ranges of the tide at full and change at the principal places will be collected at the end of the following chapter; but in the offing the time of high-water at full and change is at 12 o'clock.

Sixthly. Outside the islands, as well as between them, the tide flows and ebbs every 6¼ hours; but frequent irregularities occur, from the influence of strong winds, particularly those from the eastward and westward. The highest tide takes place at the third transit after the full and change; but experience shows that westerly winds occasion a higher, and easterly winds a lower waterstand, nearly in proportion to the force of the wind. In the offing it is never slack water; the transition from flood to ebb takes place by a change in the direction of the tide. The first part of the stream runs S., and by degrees S.E., and finally, after the lapse of 1 or 1½ hours, it sets E.S.E., following the directions of the channels in all their bays and intricacies between and inside the islands. The ebb at first runs N., then inclines to the N.W., and finally runs to the westward out of the channels, when the water has fallen a little. From these varying courses of the tidal streams it is requisite to know the exact period of the flood or ebb, as in the one case they set strongly towards the shoals, and in the latter from them; likewise strict attention should be paid to this fact, that the first half of the flood follows the direction of the channels, the edges of which are somewhat shallow, whereas on the bars and on the shoals it sets obliquely across them, nearly in a S.E. direction: hence it is of the greatest importance to allow for this when entering the channels on this coast. The rate of this stream in settled weather is commonly 1½ to 2 knots, but during boisterous weather and westerly winds, it may attain a velocity of 4 knots. It requires a favourable tide to enter or to leave the channels. *Tides.*

Seventhly. The western side of all the islands, as also the coast of Eiderstedt (in Slesvig) at St. Peter, consist of sand-downs, and accordingly no landmarks are to be had, and on the whole extent of this coast there are but a few objects sufficiently high to be visible from a vessel outside the channels, except the beacons, placed in some of the inlets, and to which the strictest attention should be paid in steering for them.

Variation. Eighthly. The Variation here was in 1850, 19° 45′ westerly, but decreasing about 10′ a-year. The courses and bearings given in these directions are all magnetic.

Graa Deep. 994. Graa Deep is the northernmost of the inlets on this coast: it lies between Fanö and Skalling, and leads to the snug little harbour of Fanö Loe, on the north-east side of Fanö; and farther on to the loading-place Hierting, where vessels drawing 9 feet may ride afloat at low water; and still farther to the northward to Varde rivulet, admitting small craft drawing 3 to 4 feet.

995. According to the Survey of 1851, the inlets to the northward of Fanö have undergone a change since they were examined in 1840; thus the Graa Deep has shifted nearly 690 yards to the eastward; in consequence of which the northern beacon on Fanö has been removed 69 yards N.N.E. from its former station, so as to serve as a mark in making the entrance when kept in one with Mill beacon, bearing E.N.E. ½ E. On this mark, the outermost black buoy, No. 1, lies outside the shallows, in 5 fathoms, 3½ miles off shore. The first white buoy is placed in 10 feet water, at the south end of the Smör Sand, E.N.E. ½ E. from the outer buoy, No. 1, with Jerne Church visible between the Fanö beacons and the mills. The direction of the channel inside of Smör Sand is now north, and between the Smörs and the shelves, along the shore shallow, where it is shoalest, with 9 to 9½ feet water, the channel is marked thus:—on the east side, a black floating beacon, carrying a basket, lies in 9 feet, and N. by E. from the white buoy; No. 2, black, lies abreast of the Fisker or Mill Deep; No. 3, black, at the N.W. point; Nos. 4 and 5, black, on the edge of the shore shallow, which is steep-to; and finally, by 4 beacon poles, the last of which stands on the Sandende. On the west side lie two white buoys, Nos. 2 and 3; No. 2 on the eastern spit of Bielken Shoal, with the white buoy at the Fisker Deep, W.S.W., and Jerne Church, E. ½ S.; and No. 3, carrying a pole, with a vane,

lies in 15 feet at the spit of the Sælhage Shoal. At the distance of 7 yards to the westward of the black floating beacon, between it and the black buoy No. 2, there are 9½ feet water in a rather narrow gut, but you cannot depend upon a greater depth than 9 feet at an ordinary low waterstand.

Smör Sand. The Smör Sand seems to be gradually decreasing, and a new channel of 7 to 8 feet depth is forming across it, in a N.E. direction from the outer black buoy, No. 1; the least depth on the Smör Sand has been found to be 4 feet, on a small patch close to the white buoy No. 1. At times a high surf beats on the Smör Sand.

Directions for Entering. As the first half of the flood runs out through the channel you should, after having crossed the bar, steer N. by E. between the above-mentioned buoys, until at the black buoy, No. 3. From thence steer N.E. ¼ N. until at the black buoy, No. 4, where the shallow is steep, from 5 fathoms to 3 feet. At this buoy, four conspicuous hills on Fanö are visible to the southward of a hill called Graabierg; and a little off the buoy Bröndum Church bears E.N.E. ¼ E. in one with the northernmost of five remarkable hillocks on the high foreland of the main, and on this mark you may stand for the inlet, to the southward of Skalling, and pass farther in between the white buoy, No. 3, on the north side, and the black buoy, No. 5, and the beacon poles on the south side, until off the north end of Sandende, on which sand the last of the four beacon poles, mentioned above, is placed. The Sandende, and also Sören Jessens Sand, extend from a half to two-thirds of a mile, and are dry at half flood. The depth in this inlet is from 4 to 7 fathoms, and the shallows on either side are steep-to. When working in, care should be taken to avoid a ridge of sand, extending S.W. ½ W. nearly half a mile from the south-east point of Sælhage, at the spit of which the white buoy, No. 3, is placed. The easternmost of the five hillocks, in one with a conspicuous cleft in the cliff, will lead to the southward of that ridge of sand.

Inlet to Hierting. 996. The inlet to Hierting is marked by the following buoys and beacons:—On the east side, along the shore shallow, at Topsand a black buoy, No. 6, lies in 12 feet, with Guldager church, N.E. by E.; No. 7, black, in 10 feet, at the Mielsand, N. by W. ¼ W. from No. 6, with Bröndum Church E. ¼ N.; and a black floating beacon in 11 feet, N. by W. from No. 7, with

Guldager Church E. by N. On the west side, a white buoy, No. 4, carrying a ball, lies in 12 feet, on the eastern edge of Sælhage Shoal; at Langelie Sand, north from No. 4, a white buoy, No. 5, in 15 feet; and a white floating beacon in 10 feet, N. ½ W. from No. 5, with Guldager Church E.N.E. ½ E.

With the northern beacon just in one with the westernmost mill on Fanö, you may steer N. ½ W. between Sælhage and the shallow from the shore up Hierting channel, minding to keep close to the small buoy on the port hand, in order to avoid the flat off Lilhoe, on which there are only 5 to 9 feet water. The depth in this inlet is 3 to 5 fathoms, both sides being steep-to, particularly at Topsand. Half-a-mile to the southward of Hierting a ridge of sand, extending from thence to abreast of Hierting, divides the inlet into two narrow channels, each of which is 138 yards wide. On this ridge there are 7 feet, but on its N.E. spit only 6 feet water. The best anchorage is to be found to the northward of the ridge, in 9 to 12 feet water, sand and sleek, on a breadth of nearly 280 yards across the channel, sheltered from all winds, except those from south and south-west, which during an ebb-tide cause some sea. Hobo Deep is a very narrow gut leading close along the inner side of Skallingen; but no marks are to be had for it. A little to the northward of Hierting a wooden pier 290 yards in length has been erected, at the outer end of which there are 11 feet at an ordinary low waterstand.

Anchorage.

Hobo Deep.

Pier.

Inner Deep of Graa.

997. To proceed through the inner or S.E. branch of Graa Deep from the small beacons on Sandende steer midchannel, S.E. ½ E., between the shallow from the shore and Meilsand which dries at half ebb half a mile off: the third hillock from the point at Bavnehill in one with the southern house in Strandby village is the leading mark for this inlet, until Fanö Mills bear S. by W. ¾ W., each of them showing in the hollows between the sand-downs, when the inlet inclines S. ⅝ E., with a depth of 4 to 6 fathoms; the Meilsand is steep-to. You may work through this Inner Deep between the Sandende and Meilsand, by keeping a small house standing to the eastward of Strandby from one to the other of two hillocks, which are the only hillocks to the eastward of the house. When to the southward of Meilsand, you may proceed through the inlet by keeping two single houses, to the eastward of Hierting, open of the cliff to the southward of the said houses. In this inlet there is good

Turning Marks.

anchorage, according to the wind, either on the flat between Strandby and Esbierg, or off the north-east point of Fanö. The inlet continues between Næsö Jord and the shore shallow, with a depth of 2 fathoms past Tierreborg; a short distance farther south it dries at low water.

998. The harbour beacon in one with the middle of the ferry-house is the leading mark to Fanö Loe or Fanö Harbour, towards which the inlet with a depth of 4 to 6 feet bends S.W. by W. ½ W., S.W. ½ W., and S.W. ½ W., between Næsö Jord, on which there are pole beacons, and the shallow from the island, close along the latter, until past the mills. As off the point, on which the beacon stands, a short sand-ridge with 2½ feet water extends towards the channel, you should keep close to the inner side of Næsö Jord. In the harbour the bottom is sleek, and vessels drawing 4 feet remain afloat at low water abreast of the ferry-house. *Fanö Harbour.*

999. Fisker Deep, also called the Mill Deep, has, on the shelf that forms its bar, a white floating beacon, with a small mill on the top of the pole: it leads directly from the sea, between the north end of the Smör Sand and the south end of the Bielk; and in making it from sea, the Mill beacon should be brought a ship's length to the northward of Fanö Mills, and on this mark steer across the bar, in which the water abruptly shoalens from 4½ fathoms to 11 feet; 8 feet is the least water, and 2½ cables' lengths the least breadth of the channel; when the depth increases, at the black buoy No. 2, in Graa Deep, you are inside the bar, and may steer as before directed. Inside the bar, on the S.E. side of the Bielk, lies a white floating beacon in 15 feet. The Fisker Deep is now more frequented than the Graa Deep, being easier of access, and having nearly the same depth on the bar.* The community of Nordby is entitled to beacon money at the following rate:—10 rbsk. per com. last for vessels inward bound, 12 rbsk. for those outward bound, and 20 rbsk. for those coming and going and clearing at the custom-house. *Fisker Deep.* *Nordby Beacon Charges.*

From the mark of Jerne Church in one with the southern house of Strandby, there is a passage for boats, first trending N.W. ½ W., and then W. ½ S., out to sea; it passes close to *Passage for Boats.*

* The Fisker Deep continues to draw to the southward, and seems likely in time to become united with the Graa Deep. The Smör Sand is gradually decreasing.

the southward of Skalling Peninsula, and crosses the north end of the Bielke, with 2 to 3 feet water at the inner end, and 5 to 6 feet farther out; latterly, from the depth having increased this passage has been more frequented, but it has not yet been pointed out by stakes. The shallow along the west side of Fanö gradually slopes to the depth of 4 fathoms, between Graa Deep and the south point of the island, off which shoals extend towards the S.W. to a distance of 2½ miles. The south end of the island is surrounded by the shoals, Kiel Sand, Meyers Sand, Indre Knude (the inner knot), and the Gallie Reef, all partly dry till high water. On the sand-downs at Sönderho there stand two pyramidical beacons, of which the northern is the largest and highest; and likewise on the south side of Meyers Sand there are two smaller beacons with baskets on their tops.

Fanö Shallow.

Sönderho Beacons.

Knude Deep. 1000. To enter the Knude Deep, the main inlet to the southward of Fanö, you should not approach the outer shallows within 4 fathoms, before you see the beacons on shore, which, brought in one and bearing E.N.E., is the leading mark until the beacons on Meyers Sand bear E. ½ S., and are in one. You will then see the outer black floating beacon (a black, oval, iron buoy, with a ball on a pole), in 13 feet water on the outside of the bar, between the shallows of Meyers Sand and the Yder Knude (outer knot) on the mark; the eastern beacon on Sönderho visible the height of a beacon to the northward of the western beacon.* This latter shoal carries only 6 feet, and its depth is gradually decreasing: vessels working in this Deep should therefore attend to the beacons on Meyers Sand, and not neglect the use of the lead. The depth on the bar is 8 feet. When at the floating beacon keep midchannel, with the beacons on the sand in one. Besides the floating beacon, a black buoy, No. 1, in 8 feet water, lies E.S.E. 1½ miles from the floating beacon; and E.S.E. from No. 1, lies another black buoy in 5½ fathoms, at the western spit of the Flakstiert; and at the north point of this stiert, in 15 feet, lies a third black buoy, No. 3, E.S.E. from No. 2. To the northward, a white buoy A. lies in 8½ feet water, on the bar, E. ¼ N. from the floating beacon buoy; and B., white, in 16 feet on the S.W. spit of Meyers Sand, and E. ½ S. from A. Having passed these buoys, the depth is 13 to

Yder Knude.

Buoys.

Flakstiert.

Knude Deep.

* On a sunken wreck, 1¼ miles to the southward of this beacon-buoy, a floating beacon painted green has been placed in 10 feet water.

15 feet, and the course E. by S. directly for Ribe Cathedral, which is visible in clear weather, and conspicuous by its high and square tower, flat on the top. The farther in, the greater is the depth, from 4 to 7 fathoms, and the shallows on both sides are steep-to, particularly at Meyers Sand, the edge of which is clean, whereas on the south side a ridge of sand extends from the Flakstiert, which should be avoided when working in. When Sönderho Mill is in one with the northern beacon on the island, the channel trends E. ¼ N., and E.N.E. ¾ E., towards the steep south-east spit of Kiel Sand; and then along it in a N. by E. ¾ E. and N.N.E ¼ E. direction; the channel is pointed out by pole beacons, with brooms, along Kiel Sand, which should be passed close, on account of a spit of sand, with 4 feet water, extending to the S.W. from the Lægg Bank, on the eastern side of the channel. On this spit a small black buoy, No. 6, carrying a basket, has been placed in 5 feet water, with Ribe church S.E. by E. ¾ E.; and on the north edge of Peelrevel Sand, in the same depth, lies No. 4, black, with a basket, from which Ribe church bears E.S.E. ¼ E. In making the channel along the east side of Kiel Sand, these buoys are to be left on the starboard hand. Farther to the northward in the channel the depth decreases, until at the beacon, placed on the north-eastern spit of Kiel Sand, with Sönderho Mill bearing W. ¼ N., and Manö Mill S.S.W. For such vessels as are able to enter the Knude Deep, the channel affords good anchorage and shelter off Kiel Sand. *Knude Deep.*

The charges at Sönderho are 16 rbsk. per com. last beacon money, for every vessel going or coming. *Sönderho Beacon Charges.*

1001. From Kielsand Point beacon to Sönderho Road the course is N.W. by N., changing gradually to W. by S. across the shallow, the whole of the distance, two-thirds of a mile: this channel is pointed out by pole beacons, and only admits vessels drawing 4 to 5 feet at an ordinary high water. When this shallow part of the channel is passed, the course is W.S.W. ½ W. for Sönderho southern beacon, between the shoals of Pender, Hornvig, and Fuglsang, on the north side, and Kiel Sand on the south side: towards the beacon on the north-west point of Kiel Sand where the depth increases to 4 and 5 fathoms. Abreast of the eastern point of Fanö, in 4 fathoms water, as also along the south-east side of Sönderho, between the shallow from the shore *Sönderho Road.*

and Kiel Sand, there is good anchorage close to the shore, except during a S.W. gale, which causes a rough sea and surf on the beach, in boisterous weather, with the wind from that quarter, Meyers Sand being covered at high water.

Gallie and South-west Deeps.

1002. Gallie Deep and South-west Deep, formerly two passages for boats, leading across the bar in 5 to 6 feet water to Sönderho Road, have recently united and formed an inlet named South-West Deep. It has about 4 feet on the bar, and has become of importance to Sönderho, the channel to the northward of Kiel Sand being now almost filled up, and with an easterly wind and ebb tide, is not practicable for the *galeasses* of Sönderho, while those boats find no difficulty in passing through the South-west deep; for their guidance a buoy painted black and white is laid inside the bar in 5 feet water, with Manö mill visible about 20 yards to the eastward of the eastern beacon on Meyers Sand.

Darum Inlet.

1003. From the N.E. point of Kiel Sand, the Knude Deep runs N.E. ¼ E., nearly in the direction of Darum Church, between the Pender Sand and the Lægg, with a gradually-decreasing depth from 17 feet to 1 foot, and terminates a mile from the shore, abreast of Darum.

Nib Inlet.

1004. At the south-east point of Kiel Sand another channel branches off from the Knude Deep in an E. ½ S. direction, nearly on the mark of Fardrup Church in one with the Tanderup village, with a depth of 3 fathoms, diminishing to 8 feet. The entrance to this channel lies between the two black buoys 4 and 5, on the Lægg and Peelrevel Sands, described in Art. 1000. Along the south side of the Lægg stand pole beacons; and as this shoal is steep-to, you should keep close to it, in order to avoid a bank with 1 to 2 feet water in midchannel. At a beacon placed in the mouth of Nib rivulet, Ribe Church bearing S.E. by E., and West Vedsted church S. ⅓ E., there are only 2 to 3 feet water, and from thence a narrow and crooked gut leads E. ½ S., S. by W. ¾ W., E. ⅜ S., and S.E. ½ S., to Outer Bierum, where the shore commences. This gut, marked by poles along its north and east sides, is from 200 to 400 feet wide, with 1 to 2 feet water, until close to the shore, where it is dry at low water. The rivulet only allows small craft drawing 3 to 4 feet to pass up to the town of Ribe, larger vessels being obliged to remain nearly 4 miles from the shore, and there to unload or load by boats or prams.

1005. The inlet to Ribe, called the Draget, leads from the sea between the Yder Knude and the Flakstiert on the north side, and the Knude and Chore Sand on the south side, to Manö Flat, along which it runs N.N.E. ½ E., and joins the Knude Deep between the easternmost spit of the Flakstiert and the north-western spit of Manö Flat; but as the depth in this channel on the shelves between Flakstiert and Chore Sand, is only 6 to 8 feet, it is only practicable to fishing-vessels, and such as are intimate with the frequently changing shoals; and attention is also required to beware of blind inlets inside the two sand-spits formed on the south side of the Flakstiert. When outside the shallows in 4 fathoms, Ribe Cathedral bearing E., and just in one with the north end of Manö, and the southern beacon on Sönderho N.E. ¾ E. midway between the northern beacon and the mill, steer E. by N. across the shallow, which gradually shoals to 13 feet, until West Vedsted Church, with a high, pointed steeple, is open of the north end of Manö. Farther in the inlet is narrow, shoaling to 6 feet; and when the southern beacon on Sönderho is in one with the eastern beacon of Meyers Sand, its direction is E. and N.N.E. along Manö Flat. *Draget Inlet.* *Flakstiert.*

1006. Jüvre Deep leads from the sea between the Knude and Chore Sands on the north side, and the Bollerd and Romö Flat on the south side, and branches off into two channels near the spit of Reisby Shallow, where the inlet has a depth of 5 to 8 fathoms; but the bar on the outer shallows, on which there is a dangerous surf during westerly gales, renders it difficult to enter. When in 4 fathoms outside the shallows, with Ribe Cathedral in one with the south end of Manö, E. ¼ N., and St. Clemens Church, which is low and just visible between the sand-downs on Romö, bears S.S.E. ½ E., steer E.N.E. ½ E. in the direction of Manö Mill, minding to keep the cathedral a little overlapping the south side of Manö; and when Sönderho Mill comes in one with the southern Sönderho beacon, you will be in 8 feet water, close outside the shallow from the Knude. By constant use the lead will indicate when you are in the channel, which is very narrow, and has a depth of 6 to 7 feet; and when Sönderho Mill is midway between the beacons, you will be in 4 to 6 fathoms water and inside the bar. Thence the channel trends S.S.E. ¼ E. between the Bollerd, which dries at low water, and the Chore Sand, which is uncovered even at high water, *Jüvre Deep.*

in 5 to 8 fathoms, with shallows steep-to on either side, but it is clearest along its south side. Near the Chore Sand will be seen

Reisby Shallow. the Reisby Shallow, which is connected with the shore, and stretches to a distance of 5 miles from it abreast of Reisby village. It is dry at low water; its north side slopes gradually, but the south side is very steep-to, and off its westernmost end, which is dry at low water, a spit of the sand extends a mile in the direction of W.S.W. ¾ W. with 9 to 12 feet water. When, steering as above directed, you get soundings off this shallow, you should incline northerly or southerly so as to follow the deep-water channel on that side towards which you want to go. On the mark of Ribe Cathedral just open to the northward of West Vedsted Church, you may stand into 2, 3, and 4 fathoms along the shallow on the east side of Manö, which is steep-to, and find good

Anchorages. anchorage, sheltered against all winds, when the southern beacon on Sönderho is in one with the north end of Manö.

1007. From the spit of Reisby Shallow you may steer S. E. by E. ½ E. nearly in the direction of Bröns church, in 5 to 6 fathoms, with steep shallows on either side; when the innermost point of Romö bears S. by W. ¾ W., the channel trends S.S.E., and you may anchor two-thirds of a mile from the north-east point of Romö, in 12 to 15 feet water, bluish clay, close to the beacons standing on the edge of the shallow, which is steep-to.

Rödeklif Sand. 1008. Rödeklif Sand lies in the offing between 55° 8′ N. and 55° 15½′ N., nearly abreast of the islands Mano and Romö; the depth on it is 4 to 6 fathoms, with coarse, yellowish-brown sand on the west side, but on the east side, where there are the shoalest parts, fine sand of the same colour. Between the east side of this bank and the outer shallows from the shore, the bottom is likewise fine yellow-brown sand, and the difference of depth is inconsiderable, and therefore the bank may be considered as part of the shallow. On its south-west side the bank in some places slopes abruptly, and the bottom outside of it, dark sand, with sleek, frequently mixed with shells. Its shoalest part bears N.N.W. ¾ W. about 12 miles from the north end of Sylt Island. This sand, however dangerous to large ships in a heavy sea, is an important and useful guide in making the inlets between List (the north part of Sylt) and Fanö.

Haf Sand. 1009. Off the S.W. side of Romö, a shallow called the Haf Sand

the greatest part of which is dry at an ordinary high water, extends 1¾ miles towards Albue (elbow) Point, on List. The outermost part of this shallow is a flat with less than 2 feet water, which slopes abruptly into the Deep, and is marked by a white buoy carrying a ball on a black pole.

1010. Close outside this sand is the Lammel, composed of several long and insulated shoals and patches, with a depth of 2 to 3 feet, but one single spot uncovers at low water. These shoals extend 3 miles to the westward of the shore abreast of St. Clemens Church, and incline obliquely towards the south-west side of Haf Sand, forming between them a narrow channel with 6 to 8 feet water. *Lammel Shoal.*

1011. Outside the Lammel lie the Rist Grounds, lying 6 miles to the W. and W. by S. from Romö, with very uneven depths. The shoalest place is the Rist, on the S.W. side of the shallow forming the northern side of Lister Deep; it consists of hard sand, and has a depth of 6, 8, to 12 feet for 2 miles east and west, its shoalest patch being on its N.E. end. The whole of the south side of the Rist Ground may be approached by the lead; and on its west side, which inclines in a southerly direction, and forms the bar at the entrance to Solt Sand Deep, the depths increase to 13, 14, and 15 feet. *Rist Ground.*

To the southward of this shoal is the Solt Sand, composed of very loose sand, extending about W. by N. from Albue Point, nearly 3 miles, within the 4 fathoms line, and having 2 to 12 feet water, until it joins the bar of the Solt Sand Deep. On the northern edge of the Sand lie the shoalest patches close to the Deep, where the depth increases suddenly to 7, 8, and 10 fathoms. These different shoals form three inlets, all joining or leading in to Lister Deep, the second main inlet on this part of the coast, and from thence to the anchorage at List, or to Romö Harbour. *Solt Sand.* *Lister Deep.*

1012. In order to render the Lister Deep and its sheltered anchorage, the only secure one on this dangerous coast, accessible by night as well as by day, in December, 1852, two lights were established on the north end of Sylt Island. The westernmost is 66 feet high, with a cupola-shaped top, and stands on Ostendie Point, in 55° 3′ N. and 8° 26′ E. The other, which is placed 2910 yards farther to the eastward, is 102 feet high, with a square top. Both lights are visible at the distance of 14 to 16 miles. *Lights on the N. end of Sylt.*

These two lighthouses kept in one bearing S.E by E.¾ E., lead, over the deepest part of the bar, in 15 feet at low water, into the Lister Deep; but immediately after crossing the bar the vessel must alter her course more to the eastward, in order to keep in the channel. The lighthouses are most conspicuous when seen from the northward. The two old beacons on List, and also the two on Romö Island, have been removed.

Bröns Hill Light. To facilitate yet more the navigation of this important place of refuge, it is intended to erect a lighthouse on Bröns Hill, in the village of Kamp, in which will be exhibited a revolving light, which, at a distance, will show its brightest glare every half minute; but in the neighbourhood the light will not be altogether eclipsed. It will stand at an elevation of 206 feet above high water, so as to be visible over the remarkable Röde or Red Cliff described in the succeeding article, and will consequently, in clear weather, afford a conspicuous object on the coast.

Albue Hills. 1013. From seaward, the land of List Point appears low; but close to the southward of it the Albue Hills rise to the height of 115 feet. From the northward these hills appear like three hummocks equidistant from each other, and visible 12 miles distant. By these hills and beacons Sylt Island is easily distinguished from Romö, on which the tower of St. Clemens Church is very conspicuous. The whole of the 20 miles of the long western shore of the island of Sylt is perfectly clean, and the only danger in approaching it is when a lee shore: it consists of the usual white sand downs, except a single remarkable cliff called the Röde or Red Cliff, nearly 4 miles to the southward of the northern part of Sylt Island, called the List, and affords an excellent mark to make the land and the Lister Deep. It is not only the highest of the sand-downs on the coast, but the whole of its lower part, rising perpendicularly from the sea, consists of a solid mass of a dark hue, being a ferruginous coarse sand and clay, and of a different appearance from all the rest of the downs. This remarkable cliff may be discerned 12 to 16 miles, when in 9 to 10 fathoms water; and during the forenoon, if the sun be not then shining, it has a dark hue, whereas in the afternoon it has a yellowish tint. Abreast of the cliff, about 4 miles off, the bottom is red sand, therefore, during the night or in thick weather, and coming from the southward, when the soundings change to red sand, instead

Röde Cliff.

of fine sand more or less mixed with sleek, it shows the vessel is in the vicinity of Röde Cliff.

1014. Rög Deep leads from sea between the Lammel and the Rist. If desirous to make this inlet, bring St. Clemens Church to bear E. ¼ S., and when in 3½ fathoms water steer S.E. by S., which course when kept strictly leads through the channel in not less than 3 fathoms, the deepest water being near the Haf Sand. Off the Rist extend some spits of sand, to guard against which you should not come too near it; the more so, as the bight between those spits have deep water, which is another difficulty in navigating this channel with vessels of great draught. If, from circumstances, forced to make this entrance, mind that you are clear to the eastward of the Rist when Röde Cliff is shut in by Albue N.W. Point; and from thence you may steer directly for the anchorage at List, taking care not to come too near the Haf Sand ridges. *Rög Deep or North Inlet.*

1015. Solt Sand Deep, between Solt Sand and the Rist, is the best and cleanest, though not the deepest, inlet to Lister Deep; and from having a great depth inside, and 15 to 21 feet on the bar, this channel, which has been for some time buoyed, is of great consequence to vessels caught on a lee shore on this dangerous coast, by affording access to the sheltered and safe anchorage to the eastward of Albue Point. *Solt Sand Deep.*

1016. Coming from the southward, with the intention of entering the Lister Deep, the intervening sand-downs may prevent the lighthouses from being seen, you should therefore keep well off the shoals in 5½ to 6 fathoms water, until so far advanced to the northward as to have the lights visible and in one bearing, S.E. by E. ¼ E. (Art. 1012): if the weather is sufficiently clear, Ballum Church tower will then be seen, standing a little to the southward of the southernmost house in Romö. On the mark—the lighthouses in one, you may steer for the entrance, but in order to clear the Rist to the southward, be careful to keep strictly on that mark, and not to bring the inner point visible outside of Albue N.W. point; then you may pass close to the southward of the Rist, and between the black outer buoy, carrying a ball, and the outer white buoy, which lies in 14 feet on the edge of the Rist; the channel being marked on its south side by three black buoys (outer buoy included), and on its north side by two white buoys. By making the entrance between these *Lister Deep from the South.*

buoys, paying great attention to the setting of the tide, and keeping the lighthouses exactly in one, you may cross the bar in its narrowest and deepest part with 15 feet water, inside of which the depth increases gradually; however, keep on the said mark until you have 6½ fathoms towards the Solt Sand and between the second and third black buoys; you must then keep one point more to the northward, or E. by S. farther in along the shoal.

Entering Lister Deep by night. At night, when the lighthouse on Brŏns Hill is completed, it is intended to indicate the moment for altering the course by the bright light there changing to red, and bearing S.S.W.; the inner black buoy, to which a good berth must be given, will then be right ahead. Proceed on the said course, E. by S., through Lister Deep, to the northward of the inner black buoy, and along the shallow in 7, 8, to 9 fathoms depth, until abreast of the outer light standing on Ostindie Point (East Indiaman Point), bearing S. by W.; then steer more southerly, about S.E. by E. ¾ E. along the shore shallow, minding to pass the inner light at the same distance as the outer one has been passed, until the inner light bears S.W. by W., then steer still more southerly until the light at Brŏns Hill again exhibits a bright light; you are then past Barling Sand, and should at once steer south, S.S.W., and more westerly for the anchorage in Lister Road. With a scant or contrary wind it is necessary, whether inward or outward bound, to pay great attention to the setting

Tides. of the tide, and during the ebb stream not to come too near the Solt Sand or the Rist, as that tide sweeps obliquely across these shoals with great rapidity, but the flood runs from them on both sides of the channel; the rippling on their inner sides is very visible, and during boisterous weather from the westward, the surf on the shoals indicates the channel. Farther in, on the contrary, both flood and ebb run along the Albue shore, and there, as also midway in the Deep, between the Rist and the Solt Sand, it follows the direction of the channel.

Land Deep or South Inlet. 1017. The Land Deep between the Solt Sand and the shore of Sylt has a depth of 3 fathoms, until near Albue Point, where on the bar that connects the Solt Sand to the island there are only 12 to 13 feet, and as the channel here is very narrow, it is only practicable for small craft. Whether inward or outward bound take care to avoid two small shelves of sand with 6 to 7 feet

water to the northward of the Röde Cliff, and extending half a mile W.N.W from the shore.

1018. These three inlets lead into the Lister Deep, the narrowest part of which, between the Rist and the Solt Sand is rather more than half a mile wide, and varying in depth from less than 4 fathoms to 10 and 11 near the Solt Sand; and to 15 and 18 near the Haf Sand. Towards the Rist the depth decreases gradually, but this sand ought not to be approached nearer than in 4 fathoms. On passing Albue Point, the villages Morsum and Keitum will first be visible over Sandgrevling Point, then Braderup, and immediately after, the easternmost houses in Kamp Village will open out, when you may haul to the southward, being then to the eastward of Barling Sand, on which there are 20 feet, and may steer S.S.W. westerly, into List Road, and anchor there in 5 to 11 fathoms, sandy bottom. Large vessels should moor in the direction of the ebb and flood stream, about N.E. and S.W. *Lister Deep.*

1019. Besides the shoals just mentioned, there are also the following to be avoided, viz.:—the Jordsand Flat, which is steep-to and marked by buoys painted white, except the one on the N.W. spit, towards Romö Inlet, which is black and white checkered, and may be approached by the lead: the Hunning Sand, to the S.W. of the Jordsand, and marked on its north edge by a red buoy, the mark for which is, the chimneys on the northernmost houses on List kept in one; and finally, the shore shallow, between Albue and Sandgrevling Points, both of which are likewise steep-to. Small craft may keep close to Albue Point when rounding it, by attention to the lead, and may anchor on the flat between that point and Sandgrevling; however, with easterly winds, such vessels as have local knowledge, seek shelter in a channel in Jordsand Flat to the northward of the white buoy D. (Art. 1021.) *Jordsand and Hunning Flats.*

1020. When, being in Lister Deep, List mill is seen to the eastward of Albue Point, you may steer E. until near the Haf Sand, which is steep-to as mentioned in Art. 1009; and then stand close along this sand, in 5 to 8 fathoms, till you enter the Romö Deep, the south side of which is marked by a black and white checkered buoy placed on the N.W. spit of Jordsand Flat, where the Romö Deep branches off in a more northerly direction from Lister Deep. The mark for this buoy is—the southern mill on Romö, bearing N.E. by E. *Romö and Ballum Inlets.*

Romö Harbour. Farther in, the north side of this inlet is marked by 5 brooms on stakes placed along the sand to the southward of Romö, the last of them being off the small bay called Romö harbour. The south side of the inlet is marked by two black buoys placed along the edge of Jordsand Flat. By following the sand the course changes by degrees more northerly, until abreast of the south end of Romö, where you may anchor and moor. Small craft may run into the bay or harbour, but they will be left dry at low water.

Höyer Inlet. 1021. With the chimneys of the northernmost house on List in one, you are on the leading mark of the channel to Höyer between the Jordsand Flat and the Hunning Sand, with a depth of 8 to 10 fathoms, and on either side shallows, which are steep-to—until past the small island of Jordsand, where the depth decreases to 2 to 3 feet, at a mile from Höyer. To guard against *Jordsand Flat.* the west side of the Jordsand, two white buoys marked Höyer, D and E, are placed there in 2½ fathoms; and farther in, at the S.W. side of the sand, there is another white buoy, Höyer F, in 2 fathoms, with the apex of the steeple of Mögeltönder Church just to the southward of Höyer Church, and Ballum Church just open to the westward of the house on Jordsand; to the northward of this buoy pole beacons are placed along the dry sand, and finally a white buoy, Höyer G, is placed in 2 fathoms on the south side of a patch extending south from the Jordsand: at the west edge of this patch Romö is open of the house on Jordsand. The S.W. side of the inlet is formed by the Hunning and Robsand Grounds; at the north spit of the Hunning, as stated in Art. 1019, a red buoy lies in 4 fathoms, and the Robsand is marked by a black buoy lying off the white buoy G, and besides these by pole beacons. Farther in, as in the canal leading to Höyer, the poles are placed on the S.W. side of the inlet. To the southward of Jordsand there is anchorage in 6 to 7 fathoms.

Listerley. 1022. Listerley is a continuation to the southward of Lister Deep, in the direction of Ness Point, between the Hunning Sand, the N.W. side of which is dry at half tide, and remarkably steep to from 14 fathoms and Leghörn Sand which is dry at low-water, and connected with the island of Sylt. At the north-west end of the Hunning there is a white buoy carrying a basket in 17 feet water, with List mill bearing N. by E. ½ E. The depth in Listerley is 5 to 10 fathoms. Keeping along the shallow from

the island in a S.W. and W.S.W. direction, you may anchor in the Irri Deep, in 1 to 3 fathoms, according to the draught of the vessel, and find shelter against N.W. gales, which produce a heavy swell in the road abreast of the mill and render the anchorage unsafe. When in Listerley, Munkmark mill bears W.S.W. $\frac{3}{4}$ W.; you may in this direction enter the Pander Deep with 4 to 5 fathoms water, between Leghörn and Butter Sand, up to $1\frac{1}{2}$ miles from its termination, where it joins the south shallow. The north-east spit of Butter Sand is marked by a black floating beacon carrying a broom, in 2 fathoms, with Munkmark mill W.S.W. $\frac{1}{2}$ W., and List mill N. $\frac{1}{2}$ E.; S. $\frac{1}{2}$ E. from the beacon, a black buoy is placed at the entrance to Vesterley. Several pole-beacons are also placed along the north-west side of Butter Sand, which is steep-to. In the inlet there is good anchorage for vessels of any size, and shelter against all winds. *Anchorage.* *Pander Deep.*

1023. From the shelves, to the northward of Rödeklif, the west side of the island of Sylt, as far south as Hörnum, is clear, with a depth of 4 fathoms a short distance from the shore, and gradually increasing to 10 and 12 fathoms outwards. From Hörnum Point shallows, which dry at low water, and in some places even at half tide, as shown in the chart, project 8 miles in the direction of S.W. $\frac{1}{2}$ S.; the breadth of these shallows in the middle is nearly 3 miles, the depth gradually increasing outward; and from being the westernmost of the shallows off Amrum, its south-west patch is called the Westbrandung (western surf). In order to distinguish Hörnum Point from the uniform appearance of the adjacent coast, and also to warn vessels of these dangerous shoals which extend to the south-westward, a Beacon has been erected in 54° 45′ N. and 8° 17′ E. It is of a circular form, and rises to the height of 104 feet above the sea; and at the foot of this beacon a sheltered place has been prepared for shipwrecked mariners, who will find benches on which they can repose, and cases containing bread and water. *Sylt Island beach.* *Hörnum Point.* *Beacon.*

1024. Amrum Bank in the offing lies 8 miles from the western point of the island of Amrum. Its depth is 5 to 6 fathoms, except on some shelves, where there are but $4\frac{1}{4}$ fathoms water. The south end of the bank lies 13 miles W.N.W. from See Sand beacon, and its depth there is 6 fathoms; its north end lies 9 miles W.N.W. $\frac{1}{2}$ W. from the southernmost high sand- *Amrum Bank.*

down on Hörnum ; its greatest breadth N.W. and S.E. is 2 to 3 miles, but its north end is only two-thirds of a mile across. The shelves consist of sand with pebbles and coarse sand, and to the northward of them fine greyish sand—the depth gradually increasing to 8 fathoms, 3 miles to the northward of the north end of the bank. To seaward the depth increases gradually to 10 and 12 fathoms, with a bottom of fine sand near the bank, then grey sand and sleek. Along its inner side the bank is steeper, deepening to 7 and 8 fathoms, sand and sleek, and thereby a channel is formed, 1 to 2 miles wide between the bank and the 4 fathoms' line off the Westbrandung shallows, with a sandy bottom. Though this bank might be dangerous to large vessels in boisterous weather, yet in moderate weather it is of great use in making the Amrum inlets, for by the soundings, a course may be shaped from this bank to them with great certainty. During clear weather the sand-downs on the south end of Sylt Island are visible, as also those along the west side of Amrum, among which the Saddledown, and farther south the Grotedown, are conspicuous; Amrum mill may likewise be seen over the sand-downs.

Hörnum Swatch. 1025. The very narrow channel called Hörnum Swatch carries but 2 feet water in its shoalest part, between the spit of sand which extends 2 cables' lengths from the south-west point of Hörnum and Thecknob, but it is only practicable for small craft.

Between the North Knob and Hörnum Sand there is another boat-passage with 2 feet water in its shoalest part; but since a mill which formerly stood on Föhr, and was used as a mark, has been taken down, the inlet has not been frequented.

Röde Deep. 1026. Röde or Red Deep is a swatchway between Hörnum Sand and Jungnamen, on the mark, St. Laurents church, on Föhr Island, just outside the north point of Amrum Island ; at present it has only a foot water, and accordingly is never used.

Fartrap Deep. 1027. Fartrap Deep is an opening from the sea, round the south point of Westbrandung Sand (Art. 1023). It leads into the channel along the inner side of the shallows, extending to the southward from Hörnum and into Hörnum Harbour or Road. When Amrum is seen the mill is brought in one with the Saddledown, which is the mark for this inlet, and leads to the northward of a shoal with 6 feet water, lying in midchannel in

the mouth of the inlet, and marked by a black floating beacon, placed on the north-west side of the shoal in 3 fathoms. As the depth on the bar suddenly decreases to 2 fathoms, frequent use of the lead is necessary. Close inside the Westbrandung there are 3 and 3½, and even 4 to 6 fathoms when the shoal is passed. The surf plainly indicates the edge of the shoal. At the outer spit of the Westbrandung, there is in 2½ fathoms a white buoy carrying a vane, N.N.E. from the black floating-beacon; a conspicuous hillock on Hörnum bears N.E. ½ N., and the Saddledown East, northerly; the mill stands a little to the northward of this sand-down, and the See Sand beacon may be seen, when the atmosphere is uncommonly clear, bearing S.S.E. ¼ E. The spit of this shoal lies in the direction of the south side of Amrum, and therefore by this part of the shore being open or shut, it may be known with tolerable certainty whether you are outside or inside of the shoal. When the mill just appears in one with the south side of the Saddledown you are abreast of the 6-feet shoal, in the mouth of the inlet; but by keeping the mill about half a degree to the southward of this mark, you pass to the southward of the shoal, and then you should stand a mile farther in a depth of 2 fathoms before you proceed up the channel. It is necessary to use the lead when crossing the bar; and to work in, it requires to be able to make a N. by W. course on the starboard tack, in order to have the flood tide under the lee until you have passed the bar. In a gale, and the wind scant, you should never attempt to make this inlet, for from the heavy sea and the tide, particularly with a N.W. gale, it is impossible to come in or out without risking ship and life. Inside the bar the channel trends N.E. by N., in the direction of the inner side of the south point of Hörnum, in a depth of 6 to 9 fathoms, and inside the North Knob there are even 12 fathoms: the inner side of all the shoals is steep-to. Besides the buoy and the beacon mentioned above, three black floating beacons point out the shoalest places along the east side of the channel. The first beacon is placed at Kniepsand flat, in 3 fathoms, 2 miles N.E. from the floating-beacon, and that is the narrowest part of the channel; the second is placed at the south-west side of Pahlström Sand, just to the northward of the western inlet to Kniep Harbour; and the third is placed at the north-west side of Pahlström Sand. These two last-

Fartrap Deep.

Bar.

Buoys.

mentioned floating beacons are in 2¼ fathoms water. Close
Hörnum Road. inside Hörnum Point you may anchor in 4 to 10 fathoms 2 to 3 cables' lengths from the beach, and be well sheltered, except with gales from S.S.W. and S.W., which occasion a rough sea.

1028. The continuation inwards of Fartrap Deep, from abreast
Hörnum Deep. of Hörnum Point, is called Hörnum Deep; it leads E.N.E. ¼ E. and then E. ¼ N., with a depth of about 8 fathoms, to the northward of the Liin Sand, on which stand two steeple-beacons with brooms; from thence the channel inclines N.N.E. towards Föhrer Schulter, with a depth of 1½ to 2 fathoms 2 miles from the shore of Föhr, where there is a spot with 4 to 5 fathoms water, but only a cable's length wide and on either side dry shallows which are steep-to. But if the intention be, with a flat-bottomed vessel, to proceed to the northward towards Vesterley, you should from Liin Sand keep close to the north side of the channel to Steenack Deep; on Steenack Sand spit, which extends from the north side and dries at low water, there are two steeple beacons with baskets, standing in a S.W. and
Steenack Deep. N.E. direction. On the south side of Steenack Deep, a black floating beacon is placed at the extremity of the shallow sand. In this extremely narrow deep there are 5 to 6 fathoms; but a short distance farther to the northward of the steeple beacon the water shoalens gradually, and it requires half flood to pass in a N.E. and N.N.E. direction, along the extensive shallow from Morsum to Vesterley; on which there are 5 to 6 feet at an ordinary high water.

Kniep Sand. 1029. The Kniep Sand is connected with the south-west side of Amrum; it is generally dry, and extends, with a narrow spit to the northward, along the island a mile to the northward of the west point, as represented in the chart. Behind this sand
Kniep Harbour. there is a small harbour, with 4 to 6 feet water, where vessels may ride in safety with all winds as long as the water does not rise over the Kniep Sand, which occurs only with westerly gales and extraordinary high spring tides; in some parts of this harbour the bottom is rock and seaweed. It has two entrances, the westernmost leading in from Fartrap Deep abreast of the north end of Jungnamen, close to the northward of Kniep Sand, between it and a sand partly dry at low water to the northward of it. The depth in this inlet is 6 feet. In entering you should round the dry point of Kniep Sand, and keep along its inner side

into the harbour, to avoid a short reef extending from the west point of Amrum Island, as well as a bank, dry at low water, and close to the northward of the point; the deepest water is found along the Kniep Sand. The northern inlet, with a depth of only 4 feet, likewise branches off from Fartrap Deep, when the north end of Amrum bears S., in the direction of a high sand-down, with a hollow in the middle, on the north point of the island: this hill, called North Hill, should be steered for until a cable's length from the beach, between it and the dry sand to the westward, minding to pass outside of the reef and of the bank at the west point of the island mentioned above. There is also a passage from Hörnum Deep, called the Kniep Deep, along the dry part of Kniep Sand to the New Schmal Deep, practicable for small craft and not unimportant to coasters. A vessel to avail herself of this passage should, from the second floating beacon, steer E.S.E. towards the Saddle down, in a depth of 9 to 10 feet at low water, until close to the Kniep Sand, and then keep S. by E. along that sand until Amrum mill is visible midway between the Saddle and Grote downs, when the shallowest part of the passage will be found on a narrow bar with 4½ feet at low water. From hence she must steer S.E. in a depth of 10 to 12 feet until she enters the Land Deep, and farther in the Schmal Deep, nearly midway between the black buoys Nos. 9 and 10; or, with the sixth sharp summit, reckoning from the westward, of the broadest sand-down in one with Grote down. Another narrow inlet, with 3 feet water, leads in a S. by E. ½ E. direction close to the north-east point of Amrum, where small craft may find shelter; the mark for entering is, to keep the large white sand down on Hörnum, close to the eastward of Helmann shoal. From hence the Föhr and Amrum Guts branch off, with a depth of only 6 inches water, uniting at the Middle Sand, about midway between Amrum and Föhr, and discharging themselves into the North Aue. With the exception of these very shallow guts, the flat between the north end of Amrum and the west side of Föhr, being dry at low water, may be passed on foot or with horse and waggon.

Kniep Deep.

Amrum Boat-Harbour.

1030. We shall now describe the inlets to the southward of Amrum, of which the New Schmal Deep, being the deepest on this part of the coast, may be considered as the third main inlet.

New Schmal Deep.

Land Deep. 1031. The Land Deep leads in from the sea, a little to the southward of the entrance to Fartrap Deep, between the south-western shallow of Amrum and the Heverknob shoals, and joins the Schmal Deep off the south-east point of Amrum. This channel should only be attempted on an emergency, on account of its being in the shoalest part very tortuous, and not a cable's length wide, with 2 to 3 fathoms water, and therefore difficult to navigate. From the shallow abreast of the inlet, Amrum mill bearing E.N.E. nearly, showing in a conspicuous hollow between the sand-downs, and the See Sand beacon S.E. ¾ S., steer E. by N. towards the Kaptains Knob (which is then in a line with the S.E. point of Amrum), and pass close along the south side of this shoal, which dries at half flood and deepens suddenly to 4 fathoms. From the dry east spit of this shoal steer E.S.E., following the deep-water channel, in which at this part there are 3 fathoms, until Amrum mill is brought behind the Grote Down, when the course is S.E. ½ E., until St. Johannes church (on Föhr) is just open of the south-east point of Amrum. At this spot the channel, with the depth of 2 to 3 fathoms, is scarcely a cable's length wide, the shallows with 2 feet, on either side are steep-to, and plainly indicated by the surf. From thence steer E.N.E. ½ E., along the south side of Jungbo Knob, another shoal abreast of the south point of Amrum, formed like a horse's shoe open towards the west, and dry at half tide. When St. Laurents church (the westernmost of the three churches on Föhr) is open of the south-east point of Amrum, you are in the Schmal Deep, inside the shallows.

Reuter Deep. 1032. The Reuter Deep, which leads in from sea between the Heverknobs, and the shallow from See Sand, has on the bar between the sea and the deep-water channel within, a depth of 11 feet, but 2 to 3 fathoms close to the extremity of the outer Heverknobs. The bar is nearly a mile across, and this inlet has the advantage, compared to those mentioned above, that the tide follows its direction; however, with a scant wind it is necessary to keep close to the Heverknobs until past the bar. About 12 miles off, to the westward of the bar, there are 8 to 9 fathoms, gray sand with yellow and black specks, and farther in 9 fathoms, bluish clay and sleek, and from thence the depth decreases gradually towards the bar, the bottom being of fine gray sand. The mark for crossing the bar is, to bring Amrum

mill to bear N.E. ¼ E., showing a little to the northward of a sand-down, conspicuous between the higher sand-downs—the Saddle and the Grote; See Sand beacon should then be brought to bear about E. ¼ N., and Pelworm old tower E.S.E. ¼ E. From hence steer E.N.E. ¼ E., or nearly a point to the northward of the See Sand beacon, which course leads close along the Heverknobs until abreast of the beacon. The shallow on the north side is steep-to along the Heverknobs, which lie on an E.N.E. bearing, the same as the direction of the channel, where the depth is from 4 to 11 fathoms.

When abeam of the beacon, keep half a point or a point more northerly, in order not to be thrown on the shallow north spit of See Sand. Having advanced so far inside of the Heverknobs, that St. Laurents Church on Föhr is seen open of the south-east point of Amrum, you are in the Schmal Deep, and may shape a course for this last-named point.

Between the two Heverknobs there is a passage for boats, with 3 feet water.

1033. The See Sand is a large white sand-bank, dry at high water, and only covered at high spring tides in boisterous weather. Its north-eastern spit lies S.W. by S., 4 miles from the south-east point of Amrum. The whole extent of the bank E. and W. is 1¼ miles, and N. and S. 1 mile; but E.N.E. and W.S.W., it has a length of 1⅝ miles.* On this bank a wooden beacon is erected, formed like a pyramid surmounted by a large circular board; it is placed half a mile from the north-east end, and two-thirds of a mile from the south-east end of the bank, its height is 62 feet, and it may be seen 10 to 12 miles when the weather is clear. The upper part of the beacon is so contrived as to afford a refuge for shipwrecked mariners. This beacon being the only conspicuous mark to be seen when outside of the shallows between Amrum and Eiderstedt, is of great importance, not only to warn vessels that have been set too near to the coast, but also as a mark for making the entrances to the west and southward of Amrum. Besides this beacon, there is on the west side of the island of Pelworm, an old square tower in ruins, flat on the top, but it is not visible far off, and even

See Sand. *Beacon.* *Pelworm Tower.*

* It appears that the See Sand has latterly, from boisterous weather, undergone a change; its outline, therefore, as shown in the chart is not quite correct.

in clear weather it is seen only just from the outer edge of the shallows.

New Schmal Deep.

1034. The New Schmal Deep, although it is the deepest inlet from sea, both for vessels bound for Wyk harbour on the island of Föhr, and for those obliged by stress of weather to look out for a refuge inside the shallows, between which, in this inlet, there are several good anchorages, yet it ought to be attempted only with the wind from S.S.W. to N.W., and the weather such that the buoys may be distinctly seen, which is an indispensable condition when standing for this narrow and intricate channel, surrounded as it is by dangerous shoals and breakers. In stormy weather, with the wind from N.N.W. and N., no vessel should try to enter, as the flood stream sweeps in a south-easterly direction with such force, that she might not be able to clear the Tusch Grounds; in such a case the Reuter Deep is preferable, from the course across the bar being more easterly, and from the current following the direction of the passage. In the spring of this year (1853) buoys were substituted for the beacons which were formerly placed in the Schmal Deep, from their being more conspicuous, and it is intended, if possible, to adopt the same arrangement on the whole of the west coast, and to make use of beacons during the winter only. The bottom and depths outside it are similar to those off Reuter Deep. From the sea the entrance is to the southward of Back Sand, between it and the Tusch Grounds, and is at present pointed out by a buoy, painted light blue, carrying a basket on a pole. Inside of it

Buoys.

there are twelve black buoys, with white numbers on them, three black floating beacons, five white buoys with black letters, A to E, and a small white buoy with a vane. The outer blue buoy lies in 26 feet, with the following bearings:—the See Sand beacon N.E. by E. ½ E., and Pelworm tower E. ¾ S. The black buoy No. 1 is placed in 3½ fathoms N.E. ½ N., from the outer blue buoy, the See Sand beacon N.E. by E., and Pelworm tower, E. by S., on the north-west side of the large flat called the Tusch Grounds. To make this inlet, bring the beacon to bear N.E. by E., in which direction it shows about a point to the southward of Amrum. When the weather is clear, and Amrum is seen, you will be able from the outer buoy to discern the mill between Saddledown and Grotedown, about a third of the distance from the last named. In thick or hazy weather, it is very

Directions for Entering.

necessary to use the lead, and if you get a sight of the buoy before the beacon is visible, you should shape a course, so as to bring the buoy in the above-mentioned direction before you steer towards it, for the black buoy No. 1, being placed 1½ miles inside the outer edge of the shallow, must not be approached in any other direction than with a N.E. ¼ N. course. The buoy No. 2 is placed in 18 feet in the bight on the north side of the northernmost Tusch Ground, E.S.E. ¾ E. from No. 1. Midway between these buoys there is a black floating beacon, and lying in the least water in the inlet, viz., 4 fathoms in a breadth of two-thirds of a cable's length, but from 3 to 3½ fathoms in a breadth of two-thirds of a mile. The first white buoy, A, is placed at the north side of the inlet in 3 fathoms, and E.N.E. from the buoy, No. 2, with the beacon bearing N.E. ¼ N. *New Schmal Deep.*

The channel is here only 2 to 3 cables' lengths across, and the shallows steep-to on both sides, particularly on the north side. From the buoy No. 2, No. 3 lies in 3½ fathoms, in an E. ¼ N. direction; from this buoy the channel trends towards the See Sand, in the direction of N.E. by E. ¼ E., by which you will arrive at a black buoy No. 4, and then at No. 5, placed in 3 fathoms at the north-eastern spit of the northern Tusch Ground, N.E. ¾ E. from No. 4, with the mill on Amrum just open to the westward of Grotedown, and the See Sand beacon N.N.E. ¼ E. To the N.W. of No. 3, at the north side of the inlet, at the spit of Back Sand, lies the second white buoy, B, in 3½ fathoms. Here the channel is 3 cables' lengths across, with a depth of 4 to 7 fathoms, steep-to towards Back Sand, of which a narrow shelf of sand along the verge of the channel dries at low water. The next black buoy, No. 6, lies in 3 fathoms on the south side of the channel, at the conjunction of the New and Old Schmal Deeps, but a little more to the eastward than the mid-channel of the latter, and in the direction of S. by W., from the See Sand beacon, and W.N.W. from the houses on Norderoog Hallig.* The buoy No. 7 lies in 3 fathoms at the Junge Jap Sand, extending from Norderoog, No. 6 bearing S.W. by W. ¼ W., and the See Sand beacon, N.W. ¼ W. The next buoy, No. 8, lies at the Alte Jap shoal, and then follows the buoy, No. 9, N.N.E. ¼ E. from No. 7, on the Svinerygg spit of sand, ex- *Back Sand.*

* Hallig signifies an island without dykes or sea-walls.

New Schmal Deep.

tending from the shallow of Nordmarsch. The breadth of the channel, in the depth of 6 fathoms, is only 240 fathoms from the spit of See Sand, in the direction of N.E. ¼ E. from which beacon lies the last white buoy, C, on the mark, St. Laurents church on Föhr in one with the S.E. point of Amrum. On passing between No. 2 and 7, it is necessary, particularly with a scant N. or N.W. wind, to keep close to the windward side as much as possible, until near the See Sand, along which the flood tide sets directly through the channel. Also having past the buoy No. 7, if entering with a flood-tide, you should keep close to the See Sand, partly to avoid a neck extending from Alte Jap, on which there are only 4 feet water, and leaving to the southward an indent with 5 fathoms, trending E. ¼ N. to the distance of a mile, where it gradually shoalens till it becomes dry, between Knudshörn and Junge Jap. For which reason it is dangerous to keep on this side of the channel, or so as not to be able with a scant wind to pass to the westward of the buoy No. 9; for the tide through Reuter Deep, sweeping across the neck from See Sand, to the eastward into the South Aue, might set you into this inlet, or on the necks extending from Alte Jap and the Svinerygg.

Norder or North Aue.

1035. The mark for the channel up the Norder or North Aue is St. Laurents Church, on Föhr Island, just open of Amrum Point, and the course to be steered past the See Sand and its spit is N.E. by N. The buoy, No. 10, is placed N.E. ½ N., from No. 9, in 3 fathoms, on the mark, Steenodde mansion N.W. by N., and in one with the south point of Amrum; and in the same direction lies the white buoy D, Amrum mill bearing N.W. ¼ W. On the east side of the channel, N.E. ¾ E., a mile from No. 6, lies a black buoy, No. 11, in 4 fathoms, and a mile farther in the same direction is the last buoy No. 12, in 7 fathoms close to the

Marschnak Shoal.

Marschnak Shoal, which dries at half tide, to a distance of 2 miles N.N.W., from the west end of Nordmarsch. From the south-east point of Amrum, where the white buoy, D, is placed, towards Föhr, the shallow is steep-to and dry; on this side of the channel the depth is 8 to 12 fathoms, but on the south side only 5 to 6 fathoms.

After having passed the buoy No. 9, steer for the south-east point of Amrum, until St. Johannes Church on Föhr bears N.E. ½ E., and then for that church, until you see the buoy,

No. 12, towards which you should then steer and pass close to the northward of it. If the wind be scant, you must keep closer to the point, on account of the tide which sweeps to leeward in this channel; but with the wind free, you may shape the course directly for St. Johannes Church, immediately after having passed the buoy No. 9, and keep along the south side of the channel.

From the buoy No. 12, the course is east towards Oeland, the houses and mill on which may be discerned when it is anything like clear weather; the south side of this channel is here marked by three black floating beacons, the first of which lies in 2½ fathoms E. ¼ N., a short mile from the buoy No. 12, and the second near a shoal with 5 feet water, S. by E. from St. Johannes Church. This 5-feet shoal, which should be avoided on account of a blind inlet, with deep water to the southward of it, lies with the west end of Hooge, in one with the west end of Nordmarsch, S. by W. ¼ W. The third black floating beacon lies with Vriksum mill just open to the westward of St. Laurents church, on Föhr: on the north side there is a small white buoy carrying a vane, in 14 feet, at the spit extending from the shore shallow of Föhr, with St. Nicolas Church bearing N.E. by N. and St. Johannes Church N.N.W. ¼ W.; and a white buoy E. is placed on the spit off Wyk Point; this spit of sand extends half a-mile from Wyk Point, and is steep-to 2 fathoms. When the shore at Wyk opens out, keep along it, and anchor either in the channel in 4 to 9 fathoms, or on the shallow along the shore; but there the depth is irregular, which renders it necessary to attend to the lead. The best anchorage is abreast of the mill and of the south end of the village, 2 to 3 cables' lengths from the beach, in 6 to 11 feet at low water. Abreast of Wyk, the channel trends eastward, between banks, which are dry at low water; a mile to the eastward of Wyk, the depth in the channel is 3 fathoms, but ending abreast of Dagebüll, where it becomes narrow, and with a depth of 2 fathoms. Off Næshörn, the east point of Föhr, there is good anchorage in 9 to 11 feet, and close to the point, there is in one spot as much as 3 fathoms.

Norder Aue Floating beacons.

Anchorage.

1036. Wyk harbour has a depth of 9 feet, at ordinary high water; vessels drawing 7 to 8 feet may enter it and lie dry in the sleek at low water. The pole beacons by which the entrance is

Wyk Harbour.

pointed out should be kept on the port hand; and as the flood tide sweeps across the entrance, it is necessary in this case to keep close to the beacons; and on the contrary to keep more to the northward during an ebb tide, to avoid being carried on the edges of the shallows. At night the direction of the entrance is indicated by two lanterns placed on poles, which should be kept in one; they are shown from sunset to sunrise. In Wyk vessels may be provided with necessaries: and as there is here a very good ship-yard with two slips, even large vessels may be repaired; but they must unload at the anchorage outside to lighten them sufficiently to enter the harbour.

Wyk Harbour Lights.

Ship-yard.

Anchorages in the New Schmal Deep.

1037. In the New Schmal Deep are the following anchorages:—

1. A short distance to the N. or N.N.E. from the buoy No. 4, with the house on Norderoog in one with Pelworm Tower, you may stand in and anchor in a convenient depth, according to the draught of the vessel (just inside the buoy the depth decreases to 2 fathoms) on a sandy bottom, sheltered against winds from S., round by E. to N.E.

2. Close to the east side of the See Sand, a little to the southward of its N.E. spit, there is a tolerable anchorage in 6 to 7 fathoms, sand, sheltered against N.W. and N.N.W. winds, but it would be doubtful whether you might be able there to ride out a gale.

3. Off the S.E. point of Amrum, the point bearing N. by W., there is shelter against winds from N. to West, but not nearer to the edge of the shallow than in 3 fathoms, where the bottom is fine sand, and good holding-ground.

Amrum Harbour.

Close inside the south point of Amrum, Amrum Harbour, with a breadth of 400 to 600 feet, trends as far as Steen Point. At the mouth of the inlet there is a bar, with 3 feet water, but across which, at present there is a narrow gut with 7 feet, and inside 8 feet, until midway, where the depth is only 4 feet, and close to the shore, off the house at Steen Point, only 2 feet water. Amrum mill, kept open to the eastward of the above-mentioned house, and standing in an elevated position at the inner end of the harbour, is at present the leading mark across the bar; when this is passed you may steer towards the point, or follow the track of the inlet along the beach. As before mentioned, the inlet itself may be considered to commence on the south side of the white buoy D, placed at the S.E. spit of the shallow of Amrum. The

harbour affords shelter against all winds, as the shallows to the N.E. and E. of it dry at half tide.

5. At the buoy No. 10, and along the shallow as far as the buoy No. 12 at Marschnak, there is good anchorage with south and easterly winds.

1038. The Süder or South Aue turns easterly from See Sand, between the Svinerygg and Alte Jap shoals, past Knudshörn shoal, and between the islands of Hooge and Nordmarsch with a depth of 4 to 8 fathoms; farther in, the channel leads between the islands Gröde and Habell on the north, and Beens and Hamburg Halligs on the south side, and giving access to the tidal harbours of Bondsiel and Süderdick. On the spits of Knudshörn there are pole beacons; and between Hooge and Nordmarsch, and where, on the south side of the channel, which is as difficult to navigate as it is farther in, unless to those acquainted with the localities, from its being destitute of good leading marks, lie two black floating beacons in 2¼ fathoms, but inside, or to the southward of them, it is shoal and with blind inlets. At the westernmost of these beacons Pelworm tower is in one with a wharf (without a house) on Hooge; from the easternmost, Hooge mill bears S.W. ¾ W., and the northernmost mill on Pelworm S.S.E. ¼ E. In entering the South Aue keep along the Hooge side where you will lose sight of buoy No. 9, and the floating beacon at Alte Jap, and pass to the northward of the pole beacons; then bring the wharf on Gröde Island to bear E. and steer directly for it. In going out you should keep towards the N.E. end of Hooge, and then along the southern side of the channel, until buoy No. 9, or the pole beacons along Alte Jap shoal are seen. *Süder or South Aue.*

1039. Close off Hooge, with the mill bearing S.S.W., there is a tolerable anchorage in 4 to 7 fathoms, clayey bottom, though rather unsafe with W.N.W. and N.W. winds, as also with easterly winds, which blow in the direction of the channel. If proceeding to this anchorage or into the South Aue from the Schmal Deep, keep along Knudshörn, where the channel is clearer, but the shallow steep-to from 5 fathoms to 3 feet. Having advanced to the buoy No. 10 in the Schmal Deep, vessels not drawing more than 6 feet may at half flood pass through a narrow gut across the Svinerygg sand, when the Steen Point house is just open of the south-east point of Amrum, steering in the direction of the western wharf on Hooge; but this passage is not practicable at low water. *Anchorage off Hooge.*

From thence and farther up the inlet steer E. ¼ S. and E. ¼ N. towards the north end of Beens Hallig, to the southward of a large bank, lying along the southern shore of Nordmarsch, on which the least depth is 3 to 5 feet, to avoid which you should keep along the south side of the channel, until Oeland mill is well open of the east end of Nordmarsch. When the mill shows midway between Nordmarsch and Gröde, the depth will be 14 to 17 feet; keep 1 or 2 points more to the northward, to avoid a bank with 5 feet water lying to the northward of Beens Hallig, with the east end of Oeland in one with the west point of Gröde. Hence the course is E.S.E. ½ E., nearly in the direction towards Bredsted mill in 2 to 3 fathoms, with gradually shoaling shallows on either side. When the house on Habell bears N.W. ½ N., steer N.E. ½ E. and N. ½ W., close round the point, of this hallig, until past its north end, when the inlet trends N.E. towards the outermost beacon at the inlet to Bondsiel; from hence keep along the beacons standing on the north and west side of the entrance, but paying due attention to the current which here sweeps across the inlet.

Bondsiel Harbour.

1040. Bondsiel Harbour will admit vessels of 10-feet draught; but it is poorly provided with moorings and posts, it is likewise deficient in sea-walls and piers, and accordingly does not afford shelter against westerly gales and extraordinary high tides.

Süderdick.

Süderdick, near Ockholm village, is a loch through which the superabundant water runs out, and will admit small craft at high water.

Old Schmal Deep.

1041. Old Schmal Deep leads from sea between the Tusch Grounds and Engel Sand, and the outermost of the extensive dry sands connected with Pelworm and Suderoog Hallig. This inlet is not buoyed, and only admits vessels drawing 5 to 6 feet, on account of two shallows with 8 to 9 feet water, on its bar, where the sea breaks even in moderate weather. Outside of the shallow off the western channel, See Sand beacon bears N.E. by N. and Pelworm Tower E. ½ S.; steer for the latter along the west and south side of the northern Tusch Ground, which may be approached by the lead; its edge is generally indicated by the rippling of the water. It is necessary to keep the lead going; and as soon as the depth is 4 fathoms, and the buoy No. 3 in the New Deep bears N.N.W., steer N.E. by N. along the east side of the Tusch Ground, which on the north side only has 5 to 6 feet

Western Channel.

water; this course leads into the New Schmal Deep, between the buoys No. 5 and 6. *New Schmal Deep.*

The south channel trends in the direction of N.N.E. between the flat off Engel Sand and the east side of the southern Tusch Ground, with a depth of 17 to 18 feet, and farther in 4 to 7 fathoms, until entering the New Schmal Deep between the buoys No. 5 and 6. It is only during unusually clear weather that it is possible to see See Sand beacon from just outside the bar of this inlet, and in order to ascertain when you are on the edge of the flat, it is necessary to attend to the lead and keep along the flat off Engel Sand; but this channel ought to be attempted only when the wind is off shore, or in moderate and settled weather. Between the shallows of Junge Jap and Engel Sand there is a narrow passage trending E.S.E. and E.N.E. to the southward of Norderoog and Hooge and between the latter and the north side of Pelworm, but here it dries, and is consequently useless. The South Channel is of some consequence to the navigation between the Elbe and the West coast of Slesvig; it is commonly frequented by coasters, and if buoyed, might be used also by larger vessels when the wind is south-westerly, more particularly as its course is direct N.N.E. and S.S.W., with a good breadth and a sufficient depth even for large ships. *South Channel.*

1042. From the above description of these different inlets, it is evident that they cannot be entered by night, and it would therefore be useless to have lights by which they might be distinguished at sea; still a powerful light would be of use in enabling navigators to ascertain their exact position, and such a light is now in course of erection on Amrum. It is intended to be visible 14 miles; and in conjunction with the recently erected lights on List, and those exhibited on Helgoland and Wangeroog, the whole extent of the coast from Romö to Wangeroog will be sufficiently provided with lights. *Amrum Light.*

1043. Old or Alte Hever Ström enters from the sea to the southward of Engel Sand, and of the large dry sand extending 4 miles to the westward from Süderoog Island. Its south side is bordered by a dry sand-bank, which is connected with the Inner Quagegrund by some smaller shelves and sand-banks. Ships being by stress of weather thrown on a lee shore here, and not able to weather the shore on either tack, might find a refuge by entering this inlet, as it leads to a sheltered anchorage off Pel- *Old Hever Ström or Deep.*

Old Hever Ström.

worm; but as it is not provided with buoys, it should only be attempted in great necessity: in which case, the following directions may be useful to navigators on such a dangerous coast, where every possible resource is of consequence. The flood stream follows the direction of this inlet, which is an essential advantage compared to others, where the tide sweeps across their mouths. During clear weather, when the objects on shore may be seen, bring See Sand beacon to bear N.N.E., and Pelworm tower E.N.E., then steer E. by N. in a depth of 4 to 5 fathoms to the southward of Engel Sand, the shallow flat of which is indicated by the surf on it, when there is anything like a swell. As soon as the beacon bears north, and the tower N.E. by E. ½ E., steer E.S.E. ½ E. in mid-channel and in 5 to 7 fathoms water; the shallows are steep-to on the north side of the channel. Farther in you will see Süderoog Sand and a dry sand-bank to the southward of it. Between these banks is the entrance, minding not to come too near the latter, which is steep-to from 4 fathoms, but on the contrary you may keep along Süderoog Sand by the lead. On the bar the water shoalens from 4 fathoms to 14 and 12 feet, and when Pelworm tower bears N.E. ½ E., and appears two-thirds of a point to the northward of the house on Süderoog, you should steer E. ½ S., across the bar, which is a cable's length wide, and has not less than 2 fathoms water. When the tower is in one with the house, you are at the eastern edge of the bar, and shortly after the depth increases to 4 and 6 fathoms in the channel inside, which is pretty wide, but has several patches mid-channel, though none with less than 2 and 3 fathoms, except one which skirts Süderoog Sand, at the distance of only 2 cables' lengths, which in some places has only 8 feet water. This patch is easily avoided, its situation being indicated by the rippling of the tide and the yellowish tint of the water. Having passed the bar, you may either keep along the steep edge of the sand, between it and the patch, or you may steer E. by N. to the southward of it in 4 to 6 fathoms water, until a small black buoy, the lower part of which is red, and lies on the mark: Tating Church spire in one with the point of Westerhever Dike bears about E.S.E., and is distant half a mile; then steer N.E. by E. ½ E. towards the south-east point of Pelworm, keeping it a little on the starboard bow; this course leads towards the shallow off Pelworm, which you should hug if

Bar.

the wind is scant, for the flood tide sweeps to the eastward, towards Heversteert, which is steep-to. When the tower bears N. ⅝ E., keep E. ¼ N. along the shallow. On account of two spits of sand, with 3 feet water extending W.S.W., a third of a mile from the south end of Oxen Sand (which is dry at half flood to a distance of half a mile from the south-east point of Pelworm, and on which is placed two steeple beacons carrying brooms, and also some stake beacons), you must not steer more northerly, until the southernmost steeple beacon bears N.E.; then the channel runs E.N.E. and N.E. by E., between the dry bank off the east side of Pelworm and the shallow from the island Nordstrand, and Rongholt Sand, with a depth of 4 to 8 fathoms, and on either side shallows, steep-to. At the southern part of the bank off the east side of Pelworm lies a buoy, half black and white, in 3½ fathoms, with Tillischer mill on Pelworm, just open to the southward of Pelworm Tower; and on Rongholt Sand stand two pole beacons, each carrying a broom horizontally. *Oxen Sand.*

1044. The best anchorage is between the south end of the bank and the shore shallow, in 12 to 14 feet water, sleek bottom, with both churches on Pelworm in one. The mark for the south end of the bank, which is pretty steep-to, is the house on Suderoog, seen just outside the south-east point of Pelworm, and the old tower in one with the mill to the southward of the New Church. *Anchorage.*

1045. From the beacons on Oxen Sand, the course to Pelworm Harbour is N.N.E. ¼ E. along the shallow from the shore, between it and the bank; and having made out the outermost stake beacon, keep it in one with the northern point of the dike. The water shoalens gradually to 6 feet, a third of a mile from the last-mentioned beacon, which is 2 feet dry at low water; but the inlet to the quay in the harbour, leading close to the northward of the small beacons, is somewhat crooked in a N.W. by W. direction, but has a little greater depth. The direction of the harbour from the quay to the loch is W.N.W. Owing to the bar at the mouth of the inlet, this harbour can only admit vessels drawing 6 feet, and these lie dry in the sleek at low water. At the north end of Rongholt Sand the channel branches off into two different inlets, the easternmost of which leads to Nordhafen in the island Nordstrand, and afterwards in a S.E. by E. and E. by S. direction along the north side of *Pelworm Harbour.* *Rongholt Sand.*

Nordstrand, but shoalens farther in and joins Holmer Fähre, in 4 feet water in the vicinity of Hattstedt Dike.

Nordhafen. 1046. When the outer beacon on Rongholt bears S.S.E., you may run into Nordhafen by steering S.E. by E. ½ E., in 4 to 6 fathoms water, along the small beacons standing on the north side of the sand, nearly in the direction towards Hattstedt Church, conspicuous by its height and its pointed steeple. The point beacon, with two brooms showing the entrance to the harbour, is placed N. by W. ½ W. from the northern mill on Nordstrand, and from thence the course is S.E. and S.S.E., in 3 to 5 feet water along the small beacons on the south and west sides, which should be kept to starboard. Nearer the dike the gut or inlet is crooked, and dries at low water. The direction of the harbour is N.N.W. and S.S.E., and it admits vessels drawing 3 to 4 feet. Two cables' lengths to the eastward of the outer stake-beacon at the inlet there is good anchorage in 2 to 3 fathoms, sandy bottom.

Inlet to Bordelum Siel Harbour. 1047. The other branch of the channel, when Hattstedt Church bears E.S.E. nearly, and the house on Südfall S.W. ½ S., leads from the beacon on the point of Rongholt Sand, in the direction of N.N.E. ½ E., and in a depth of 3 to 4 fathoms, along the steep shallows from the north side of Pelworm; they should be kept close to, as the other side of the inlet is foul, having, at half a mile to the N.W. from the west end of Nordstrandischmoor, a bank with 2 feet water, inside of which is a narrow blind passage or inlet in the shallow. To the northward of this bank, and of another dry one lying to the northward of the hallig of Nordstrandischmoor, this very narrow inlet inclines towards N. by E. ½ E. and N.E. by E. ½ E., with a depth of 3½ and 4 fathoms. When the house on Hamburg Hallig bears N.E. ½ E., steer E.S.E. ½ E., or a point to the southward of Brecklum Church, until the latter bears E. ½ S., and the house on the hallig N. ½ E., then the channel trends just in the direction of the church, and finishes at the distance of 2 miles from the shore with a depth of one fathom. Hence the inlet to the small harbour at Bordelum trends first N.N.W., and then in a curved direction N.E. and E.N.E. nearly, for Stolberg mill, until half a mile from the dike, from whence the gut to the harbour winds along a range of stake beacons, which should be kept to starboard. Small craft drawing 6 feet may enter

Bordelum Harbour.

this harbour, which is so narrow as not to allow two vessels to lie alongside of each other in the gut, and is entirely destitute of quays and moorings, or posts to make fast to.

On the shallow from Pelworm to the northward of the harbour, stake beacons are placed towards the Beens and Hamburg Leys; the entrances to those Leys are marked by a steeple beacon having two brooms horizontally.

Anchorages in Old Hever Ström.

1048. In the Old Hever Ström, or Deep, are the following anchorages:—

1. Along the south-east side of Süderoog Sand there is shelter against N. and N.W. winds, in 7 to 5 fathoms water, but not nearer the sand on account of the steepness of the ground.

2. Off the flat between Süderoog and Pelworm, the house on Süderoog bearing W.N.W., and Pelworm tower N.N.W., there is good anchorage in 2 to 3 fathoms, sandy bottom, and shelter from winds from W.N.W. round by N. to E.N.E.

3. To the eastward of the black, red-bottomed buoy, with Pelworm tower bearing N. ¾ E., you may stand in on the flat off Heversteert and anchor on sand, sheltered against south and easterly winds; but on the rest of the north-west side of Heversteert the shallow is steep-to from the deep-water channel.

4. To the westward of the southern beacon on Oxen Sand, with Pelworm tower bearing N.N.W. ¾ W., and the house on Süderoog W. ¼ N. off the shallow from Pelworm, there is shelter with the winds from N.W. round by N. to N.E.

New Hever Ström.

1049. Vessels coming from the westward and bound for the entrance of the New Hever Ström,* leading to Husum Road and Harbour, ought to ascertain their true position by bearings of Helgoland, so as to be able to shape a direct course for the outer red buoy, placed in 5¼ fathoms water, 3 cables' lengths to the westward of the outer edge of the bar, between the Quage-grunds and the flat off Rockel Steert: Pelworm tower bears from it N.E., and Tating church is visible its own breadth to the southward of the highest sand-down of St. Peter; St. Peter mill, E.S.E. ½ E.; St Peter beacon, S.E. by E. ½ E.; and the light-house on Helgoland, W. ¼ S. Between S. by W. and S.S.W. from this buoy, at 1 to 2 miles distance, there are 4 to 4½ fathoms at low water.

* See also the Chart of the Entrance to the River Elbe.

New Hever Strom from the North.

1050. Vessels coming from the northward may be guided by bearings of See Sand beacon, and those from the southward by bearings of the light-vessel at the mouth of the river Eider, and St. Peter beacon on the main. Close outside the mouth of this inlet, as also to the northward and southward of it, there are 5 to 6 fathoms water, fine grey sand, and, in anything like clear weather, the shore at Ording and St. Peter is visible, though the sand-downs are low, and with a light-yellowish tint. St. Peter Church and mill are the most conspicuous, and, in very clear weather, Ording Church, with its low tower and short spire, shows between the sand-downs. Pelworm tower and the house on Süderoog are just visible in the horizon.

Having brought Pelworm tower to bear N.E. ½ E., Peter mill E.S.E. ¾ E., St. Peter beacon E.S.E., and the northernmost sand-downs at Ording East, steer on the latter bearing for the outer buoy; but mind do not bring the sand-downs at Ording, nor the mill to bear more to the northward than above directed, particularly with a scant wind and a flood tide, in order to avoid being carried on the shallow of Rockel Steert. Besides the outer red buoy, the south side of the channel is indicated by one floating beacon and 16 black buoys, of which 11 are numbered commencing from the outer one, and placed thus:—No 1, in 13 feet, and the floating beacon in 3 fathoms on the east side of the bar. Nos. 2, 3, 4, and 5, along the shallow of Rockel Steert on the south side of the entrance. Between Nos. 5 and 7, the shallow off the neck of Westerhever, and the Rockel Steert, has increased towards the mouth, so that the channel which separated this shallow from a nearly-covered bank connected with Robbe Sand, is now filled up, and a new channel has been formed more to the northward, the south side of which is indicated by 3 black buoys without numbers, and No. 6; all of them are placed between Nos. 5 and 7, the 3 first in 3¾ and 4 fathoms water, and the last, No. 6, in 17 feet on the mark, Garding church just open to the westward of the dike point of Westerhever; No. 7 lies in 4¼ fathoms, and E.S.E. ½ E. from No. 6, with Garding church in one with the west point of the dike. No. 8 at the south-west end of the Middle Plaat, and Nos. 9, 10, and 11 at the N.W., N., and N.E. spits of this latter shoal; and farther in the inner channel between Nordstrand and Simonsberg, there is placed a black buoy without a number,

Buoys.

in 3 fathoms, at Rohlhagen spit, with Ulwesbüll church bearing S. $\frac{1}{8}$ W. Between Nos. 8 and 9, is placed a black buoy without a number, in 3 fathoms, N.E. by E. from No. 8, with Westerhever church tower a little to the eastward of Stufhausen village. On its north side, the channel is pointed out by 7 white buoys, 6 of which are marked with letters from A to F, and one not marked placed at a projecting edge of the Quagegrund, in 28 feet, and E.N.E. $\frac{3}{4}$ E. from B, with Tating church S.E., and Süderoog N.E. by N.: A in 14 feet, B in $4\frac{3}{8}$ fathoms; C, in 3 fathoms; D, in $2\frac{1}{4}$ fathoms, at the outside of a nearly-covered bank, connected with the Robbe Sand, from which it extends towards the W. and W.S.W.; E, in 4 fathoms, at the southern extremity of Robbe Sand; and F, in $4\frac{1}{4}$ fathoms, off the N.E. spit of that Sand. Between C and D, and the 3 black buoys not numbered, and No. 6, the channel is at present very narrow with only 17 feet at low water, which is the least depth across the channel between D and No. 6. At the shallow of Südfall, and to the N.E. of this buoy, there are three stick beacons with baskets, which mark the north side of New Nau. *New Hever Ström Buoys.*

Besides these buoys there is another painted white, G, in 25 feet, at the north-eastern spit of the inner Quagegrund, N.N.E. of the black buoy No. 4, and N.E. $\frac{3}{4}$ E. of the white buoy without a letter, with Brösum mill just open to the eastward of Brösum church; and there are two black floating beacons off the S.W. extremity of Heversteert; one in 17 feet N.E. by E. of G, and the other in 24 feet at Pouls Knob, N. by E. from the former. Finally, on the south-east side of Robbe Sand, and on the shallow from Nordstrand, there are many stakes with baskets, viz., three on Robbe Sand, carrying brooms, between the buoys E and F; 22 with baskets on the Nordstrand side, from Südfall to Moordick, the one on the flat spit carries a basket and broom, and on the shallow from Westerhever, opposite to the buoys E and No. 8, there are two stick beacons each with a triangular top; and again on the N.W. side of Lundenberg Sand stand two more. Between E and No. 8, a green buoy is placed in 15 feet, near a wreck; the wreck lies in less than 7 feet water.

1051. The course from the red buoy across the bar in 14 to 15 feet water is E.N.E., and then N.E. between the buoys A and No. 1, until, at the floating beacon, when Pelworm tower bears *New Hever Ström Entrance.*

New Hever Ström Entrance.

nearly N.E., you will have passed the bar. If the atmosphere be sufficiently clear to discern Pelworm tower and the house on Süderoog from outside the bar, bring these objects in one and steer on this mark N.E. ¼ N. across the bar, close to the eastward of the floating beacon and between No. 2 buoy on the south side, and the Quagegrund buoy B, on the north side, where the shallow is steep from 6 fathoms. Until past No. 2, it is necessary, as before remarked, to keep close to the west and north side of the channel, particularly with a scant wind, or if working through with a flood tide which sets towards Rockel Steert, but inside No. 2 buoy it follows the direction of the channel. From No. 2, steer E.N.E. ½ E. and E. by N. mid-channel, in 4 to 8 fathoms water, to the northward of the buoys 3, 4, and 5, and to the southward of the white buoy without a letter, at the Quagegrund. When at No. 5, Tating Church is well open to the northward of the northernmost sand-down at Ording, you are off the spit of the Heversteert bank, on the south side of which are placed the buoys C and D, and you must then steer N.E. by E., E.N.E. and E. by N., to the northward of the three black buoys without numbers, until Brösum mill is just open to the westward of St. Peter mill, on which mark the third of these buoys and the buoy C are placed; from hence steer east between D and No. 6, where the channel is narrow, with only 17 feet, and afterwards E.S.E. ¼ E., to the northward of No. 7. In passing between these buoys, avoid getting too far to the northward during a flood tide, which here sets directly towards the Robbe Sand; for if, with the wind free, you happened to get to leeward or to the northward of the buoy C, it would be impossible again to get to the westward of it against the flood tide. Between the buoys C and D, on the north side, and 5 and 6 on the south side, the channel is rather narrow and the shallows steep-to. From No. 7, lying in 4½ fathoms, 1½ cables' lengths to the northward of the dry shallow from Westerhever, and N.W. by W. from Westerhever Church, the channel formerly turned E. by N. and E.S.E. along the Eiderstedt shallow, but that channel, at present, has only a sufficient depth for boats. Nature has now provided a deeper channel to the westward and northward of the Middle Plaat Sand, which then was connected with the Robbe Sand. Therefore, from No. 7 you are now to steer N.E. by E. ½ E., mid-channel, between two

steeple-beacons with brooms, standing on the shallow of Westerhever and the buoy E, on the north side, to the buoy No. 8, placed in 3 fathoms N. by W. ½ W. from Westerhever Church, which will then appear in one with a house on the dike of Westerhever. From No. 8, steer N.E. by E. ½ E. and E.N.E. through the channel, called the New Nau, nearly in the direction of the house on Südfall, until, having passed No. 10, when the course is E.S.E. between the shallow of Südfall and the north side of the Middle Plaat, to the three steeple-beacons with baskets to the southward of Südfall. The shoalest places with a depth of 3½ fathoms is between the buoys Nos. 8 and 9. In passing between the buoys Nos. 8 and 10, mind, when the three beacons have been passed on Robbe Sand, to keep close to the edge of the Middle Plaat, during an ebb tide, for this tide sets to the westward, through a narrow channel that runs across Heversteert Sand, in a westerly direction between the buoy F and Südfall.

New Hever Ström.

New Nau Channel.

From the three steeple-beacons with baskets at the south side of Südfall the course is S.E., in 4 to 6 fathoms water, between the beacons on the north side, and the black buoy No. 11, to the beacon on Hohe Hörn, which carries two baskets. From thence steer the same course, until Tetenbüll Church is in one with a conspicuous house on the dike by Tetenbüll Spicker harbour, on which mark stands the innermost beacon on the shallow of the Eiderstedt shore, and points out the inlet of this little tide harbour. Thence the course is E.S.E. ½ E. along the beacons on the northern side of the channel, which, accordingly, are left to port; but Simonsberg Church should be kept a little on the starboard bow, in order to avoid a bank on the south side of the channel. When Witzwort and Ulvesbüll churches are in one, steer N.E. by E. ½ E. directly for Hattstedt Church, and pass to the northward of the small black buoy which lies at Kohlhage Spit, on the south side of the channel, Ulvesbüll church bearing S. ½ W., until Oldenswort Church is in one with Tönning tower, to avoid Lunderberg Sand, on the south side of the channel, which is steep-to, and dries at a common high water. On this sand stand the two steeple-beacons mentioned above, the westernmost carrying a wooden arm pointing to the westward; to the W.N.W. of it, the Moordick beacon, the next and last beacon on the Nordstrand side, has a similar arm pointing to

Tetenbüll Inlet.

Lunderberg Sand and Beacons.

the eastward. Thence the channel runs E. by N. with a depth of 16 to 20 feet, and a breadth of 2 cables' lengths towards Husum Aue (river). The mark for the outer beacon, at the entrance to this river, is Hattstedt and Schobüll churches in one, and Husum tower bearing E.S.E. Outside of this beacon lies the road and anchorage on a sleek bottom, with shelter even against a westerly gale; but during the winter this road is very unsafe, on account of the ice.

Husum Road.

Husum Aue and Harbour.

Inside the last-mentioned beacon there are smaller beacons, which in entering are to be left to starboard. The direction of the river, with a depth of 10 to 11 feet, at high water, is first E.S.E. directly for Husum Church, visible between the straw, reed-covered dykes, about one mile. Farther in, the entrance is very crooked, but it has been made somewhat more direct by a canal, cut in a S.E. direction, to a depth of 12 feet, and a breadth of 20 feet at the bottom and 40 feet at the top. In order to produce a depth of 14 feet through the whole of the river, by an augmented force of the stream, two artificial shores have been constructed, nearly up to the common high-water mark, and, to prevent their being washed away, they are thatched with reeds. Through this limited aperture, it is supposed that the ebb tide, in running out with increased velocity, will produce a greater depth; and to effect this still more completely, it is intended to allow a considerable volume of water to pour out by means of a sluice, in the direction of the rivulet; but even if a sufficient depth be obtained, the narrowness of the channel will allow only a few vessels to be admitted at a time into the rivulet. The present harbour admits vessels drawing 7 feet; but considerable works are now in progress to improve it and to furnish it with a dock, capable of admitting vessels of 16-feet draught.

1052. Vessels drawing 8 to 10 feet, coming from sea and bound to Husum Road, or to Pelworm, have no occasion, when coming from the southward to go round the outer red buoy at the mouth of the inlet, but may coast along the gradual shallow of the shore of St. Peter, in 9 to 12 feet water, and stand across the Rockel Steert sand into the New Hever Ström, by passing close to the eastward of the buoy No. 2. The entrance to Nordhövt to the N.E. of Ording was formerly from No. 7 buoy, within the dry sand-banks of Rockel Steert, but now the Steert at low water

Nordhövt Harbour.

dries along its whole extent between Westerhever and the black buoy, No. 3. However, to the southward of Rockel Steert a passage has formed itself in a N. by E. and easterly direction to Nordhövt with 2 to 3 fathoms water at its entrance, decreasing gradually to Nordhövt, where you will have only 2 feet at low water over a soft bottom, but still it is a good loading-place, as well as a safe harbour. The inlet to Pelworm is at the buoy No. 4, and leads N.N.E. across the bar between the inner Quage grund and Heversteert, on which are 12 to 15 feet; the deepest water is found in the vicinity of the white buoy G, which should be left on the port side, but with a flood tide it is necessary to keep somewhat to the westward of the buoy, the moment it becomes visible, in order not to be carried on the Heversteert; and having passed the floating beacon at the spit of this sand, steer N.E. by E. to the northward of another floating beacon, on a shallow patch, called Pouls Knob, but not farther distant from the former than to have it well visible, and continue the same course towards the black buoy with the red bottom, mentioned in Art. 1043, and then follow the directions given above. Both the Heversteert Sand and Robbe Sand are intersected by several small channels or passages, one of which from the white buoy F runs in a W.N.W. ½ W. direction towards the black buoy with the red bottom; and another still smaller channel to the southward of Südfall are navigable for small craft, but are not beaconed, being in fact but little frequented.

Inlet to Pelworm.

Pouls Knob.

1053. The New Hever Ström contains the following anchorages:—

1. To the eastward of the buoy No. 5, you may anchor off the shallow in 15 feet, on the mark of St. Peter mill in one with Ording Church, sandy bottom, and sheltered from winds from S.S.W. round by S. to E.

Anchorages in the New Hever Ström.

2. Off Südfall, the house bearing N. there is anchorage for small craft, close to the island, at half-flood tide, where they must lie dry in the sleek at low water. This bight is pointed out by three small stick beacons, which should be kept to port in entering.

3. Off the inlet of Tetenbüll Spicker, there is a good anchorage in 2 fathoms, sleek bottom. This inlet, from the outermost beacon, runs S.W. ½ W. and then S.S.W. with 9 to 10 feet at high water, along the small beacons on the western side. The

harbour consists of two basins, but the westernmost has the best anchorage. Vessels drawing 7 feet may enter this harbour in perfect safety with all winds. In entering, mind that outside the dry sands the tide sweeps across the inlet.

Moordick. 1054. From the beacon off the south-east side of Nordstrand, small craft may at half flood stand across the shallow, and run into Moordick.

Englands Loch. From the last beacon on the Nordstrand side, a very narrow and crooked gut leads to Englands loch, but only practicable to such small craft as trade between Nordstrand and Husum.

Simonsberg Loch. From Dörheits beacon, carrying a broom, and standing on the northern spit of Lundenberg Sand, the Simonsberg loch trends first S.E. by S. across the bar with 1 to 2 feet water, and then with several turns, falls into the shallow, dry at low water, between Heckelskoeger Hallig and the shore abreast of Simonsberg Immediately inside the bar, there is a hole with 2½ fathoms water; but farther in, it is dry at low water. Along its east side, abreast of the shallow off Finken Hallig, a range of old piles may be seen at low water.

Channels between Eiderstedt and Fanö. 1055. We will now describe the inner passages between Eiderstedt and Fanö, for although they are but of little consequence from being only practicable, at high water, to small craft, drawing 3 to 5 feet water; and although such coasters are in general well acquainted with the localities and the constant changes to which several of these inner channels are liable, yet as they are shown on the chart and might possibly be of some use, a short description of them, may not be unprofitable.

Holmer Fähre. 1056. Holmer Fähre leads from the Hukbaaken Point beacon off the Husum river, in a curved direction N.E. ¼ N. to N.N.W., then N.N E. and N.W. ½ N. between Pohns Hallig and the shore-shallow, with a depth of 1 to 2 fathoms and a cable's length in breadth; and at the distance of half a mile from the point of the dikes at Hattstedt it joins the inlet from the westward, leading to the northward of Nordstrand. The bottom in this inner channel is sleek, and the shallows on both sides are steep-to and dry at half flood; the small beacons indicating the channel are placed on its west side.

Butterlock and Sandshörn. 1057. The inner passages, Butterlock and Sandshörn, which formerly admitted boats, are now filled up, and the beacons have consequently been removed.

1058. The Strand channel branches off from the northern end of the Alte (Old) Heverstrom, to the northward of the Hamburg Hallig, and leads into Süder Aue Deep; but from the house on the hallig, it dries 2 feet at low water, and is only practicable near high water for vessels drawing 4 to 5 feet. The place of the southern beacon is Stolberg mill in one with the house on Hamburg; the northern beacon stands S. ¼ W. from the house on Habel and W. ¼ N. from Stolberg Mill, and coming from the southward, it is made by bringing Hattstedt Church a little to the northward of Hamburg House, which is the leading mark towards the beacon. *Strand Channel.*

1059. Beens Ley branches off from the northern end of the Old Hever Ström, and leads into Süder Aue Deep, over the shallow N. E. of Pelworm, in a N.W. direction towards Beens Hallig, where it divides into two guts to the eastward and westward of the Hallig; but this Ley is only practicable during high water for vessels drawing 5 feet. *Beens Ley.*

When Oeland Mill shows midway between Nordmarsch and Gröde, the vessel being then in the Suder Aue, steer N. E. by N. for the mill, across a flat with 3 to 10 feet water towards the southern beacon at the Schlütt Deep, which bends N. by W. N.N.E. and N.E. by E. across the shallow, close round the west point of Oeland, till it joins Oeland Deep. The Schlütt channel is dry at half-tide, and is only practicable during high water for small craft drawing 4½ feet. From the northern beacon, vessels drawing 3 to 4 feet may stand across the shallows, to Wyk on Föhr by steering N.W. by W. ¼ W., on the mark of St. Nicolai Church in one with the south end of the village Boldiksum. From the same beacon the course to Dagebüll Harbour is first N. ¼ W. until St. Nicolai Church is in one with the middle of Boldiksum, to the northward of a sand-bank, lying N.N.W. from Oeland, and then N.E. ⅝ E. towards the inlet to Dagebüll Harbour, with 6 to 8 feet water. Two harbour lights, erected on the dike, must be kept in one to enter between the thatched dykes, which form the inlet to the harbour; in this inlet the depth is only 6 to 12 inches at low water and runs in a crooked direction between N. and E; the small beacons are to be kept to starboard. Vessels drawing 4 feet may enter this harbour, in which, however, there is no shelter against westerly winds; its only use being for the ferry-boats between Dagebüll and Wyk. *Schlütt Channel.* *Dagebüll Harbour.* *Harbour Lights.* *Ferry to Föhr.*

Rockel Ley. 1060. At the southern beacon of the Schlütt, there was formerly a similar gut, the Rockel Ley, trending E.N.E. to the southward of Oeland, but like those of Butterlock and Sandshörn, mentioned in Art. 1057, it is now filled up; the Schlütt is therefore the only passage practicable from Wyk to the southward.

Föhrer Ley. 1061. Föhrer Ley leads from Næshörn, along the eastern side of the island Föhr, towards the inner end of the Fartrap Deep; it is provided with stick beacons on its west side, but abreast of the N.E. point of Föhr it is dry before half-tide.

Vester Ley. Vester Ley branches off from the inner end of Fartrap Deep, in a N.N.E., and N.E. by N. direction, towardst the Ness on Sylt Island, and thence N.W. and N.W. by W. into Lister Deep, but abreast of the Ness it is very shallow, having only 2 to 3 feet at low water, and with ordinary high water, only practicable for small craft drawing 5 feet; but in some spots there are 6 to 7 feet at low water.

Horsbüll Steert. Within the Vester Ley, lies a long narrow shoal or reef named Horsbüll Steert, that dries at low water. Small craft going from Vester Ley to Fartrap Deep have to pass between this reef and the shore shallow, in a narrow but steep channel, which takes them down past Steenack. In going from Vester Ley to Föhrer Ley you cross the S.W. Edge of the Steert, which is pointed out by 6 stick beacons, and has on it 5 to 6 feet at high water: on the east side of the Steert there are also stick beacons, as it is sometimes advantageous for coasters, when working, to go through Galmsbüll Ley, to the eastward of the Steert, between it and the main land.

Gänge Ley. Gänge Ley leads over the shore shallow of the north side of Föhr into Hornum Deep, and being now practicable at high water for craft of 4 to 5 feet draught, it has been pointed out by stick beacons.

Galmsbüll Ley. Galmsbüll Ley branches off N.E. $\frac{1}{2}$ N. from the Föhrer Ley, towards Southwesthorn (on the main), and trends first N.W. by N., then S.W., and then N.W. across the sand of Horsbüll Steert, and finally N.E. by E. over the Dragt Sand.

Öster Ley. Öster Ley which formerly led in a N.W. by N. direction, between the Dragt and the Hesten Sands, is now nearly filled up; it is not beaconed.

Jordsand Ley. 1062. From Jordsand, a mile from Höyer village, on the main, the Jordsand or Koldby Ley sets off in a northerly direc-

tion, inside of the small island of Jordsand, crosses the Flat, bends round the shore, and then passes over Bodsböll Flat, towards the inner side of Romö. This gut is dry at low water, but has beacons on its west side. In passing from Höyer inlet to Jordsand Ley, you cross a level shore with about 2 feet at low water, until abreast of Jerpsted, where the first stick-beacon from the southward stands.

Romö Ley.

1063. From the deep-water channel to the south-east of Romö you may steer N.E. ½ E., in 3 to 5 feet water, for the beacon, standing E. ½ N. from St. Clements Church; there the Romö Ley branches off N. by W., and N. by E. ½ E. towards the north-east point of Romö, where it discharges itself into the Jüvre Deep. In the shallowest place, where the gut turns to the northward, it is entirely dry at low water.

Manö Gyde.

1064. The southern beacon on Chore Sand stands S. by W. ½ W. from Manö mill and W. ¼ N. from Hvidding Church; and from thence a gut called Manö Gyde leads N.N.W. two-thirds of a mile, then N.N.E., across the shallow, which consists of sleek, and is a foot dry at low water; afterwards it turns N.W. by N. and W.N.W., with a depth of 11 to 17 feet, and a breadth of 1 to 2 cables' lengths between Manö Flat and the Chore Sand, being steep and dry on both sides.

Chore Sand Anchorage.

1065. Off the Chore Sand there is good anchorage for small craft, and shelter, even with westerly gales, as part of the sand is dry at ordinary high water.

At the western dry spit of Manö Flat there is a small buoy in 3 feet water, carrying a broom, about west from Ribe Cathedral, which is seen over the north end of the island of Manö; but this buoy is shifted occasionally from the frequent changes in the inlet. There is also another small black buoy in the channel, in 3 feet water, at the south side of Manö Flat, with the eastern beacon on Peter Meyer Sand in one with the N.W. point of Fanö Island: a third of a mile to the westward of the spit buoy stand two small beacons, on a dry bank, to the northward of the Chore Sand. Between this bank and the spit buoy, the entrance to Draget Deep trends in the direction of N.W. by. W., across the ridges of sand between the Chore Sand and Manö Flat, with a depth of 2 to 4 feet at low water. During gales from N.N.W. round to W.S.W., this part of the channel is not practicable, on account of the high surf on those ridges.

Draget Deep.

Kielling Lo. 1066. Kielling Lo unites the northern branches of the Knude Deep, with the inner end of the Graa Deep winding round from the southern beacon N.N.W., N.N.E., and again N.N.W. between Pender Sand and the shore shallow, with many beacons on its west side. In the southern part of the channel the depth is 4 to 7 feet, but the northern part is dry at low water.

Wringle Lo. 1067. The Wringle Lo, which formerly led N. by E. and N.W. between the Trinden and Hornvig sands, and afterwards between Pender Sand and the Weser Bank, is now filled up.

The Eider River.

1068. The River Eider discharges its waters between the far-extending shallows of the Ditmarsch Grounds, and of those projecting from Eiderstedt. At the fortress of Rendsborg, the *Slesvig Holstein Canal.* Slesvig Holstein Canal branches off from this river, and thus forms a navigable communication between the Baltic and the North Sea. The river runs with several sinuosities and bendings from Rendsborg, past the towns of Friedrichstadt and Tönning. Vessels drawing 14 to 15 feet might come up as far as the latter harbour, but the shallow bar, called the Drögden, and the 9 to 10 feet shallows in the present new channel, between the North and South Racks, and off Wollerwick (a village in Eiderstedt), added to the inconvenience of an intricate and, in many places, very narrow channel, are obstacles which render the pilotage of this river both difficult and troublesome, and which, with certain winds, it is impossible to surmount.

Steam-tug. With a view in some degree to remedy these impediments, a steam-tug has been stationed at Rendsborg, and is very frequently employed between that town and Tönning.

Pilot Galliot. 1069. To facilitate the making of the Eider, a galliot carrying the Danish flag at the main, and on board of which are pilots, is stationed at the mouth of the river. From this vessel *Light.* a Light is shown, elevated 34 feet above the level of the sea, and visible 10 miles, when the weather is clear. The galliot is moored to the southward of the shoal Fiegen Plaat, in 4½ fathoms, St. Peter beacon bearing N.E. ¼ N., Weslingburen Church E. ¾ S., and Helgoland Lighthouse W.N.W. ¼ W., 24 miles. This vessel is brought to her station at the end of February, if the ice does not prevent it, and removed the 30th

of November. At high water a signal is made from the mizen gaff of the galliot, to indicate the depth of water on the Drögden, viz.:— *Signals.*

When the depth is 6 feet	1 ball.
7 do.	2 balls.
8 do.	A cross.
9 do.	A cross over 1 ball.
10 do.	A do. over 2 balls.
11 do.	A do. between 2 balls.
12 do.	2 balls over the cross.

When the signal is made, the pilot attends, and if he is prevented from coming alongside on account of the rough sea, his boat leads, and the vessel must follow in her wake, until arriving in smooth water in the river, where the pilot may be taken on board.

1070. On a sandhill 25 feet above high water, S. ¼ E., and a long mile from St. Peter Church, a 46-feet high, pyramidal wooden beacon is erected, and carries a trellis, which faces S.W. by W. On approaching the outer shallows, you will, provided the weather be clear, be able to see Tating Church, having a large red-tiled roof and a high painted steeple, together with St. Peter mill, mentioned before, and Weslingburen Church; the shore in front having a dark hue. By taking bearings of these objects, the position of the vessel may be ascertained, but the island of Helgoland is the most useful object for making the or any other of the inlets between the Hever and the Elbe. *St. Peter Beacon.*

h sides of the channel in the Eider are remarkably well d out by black and white buoys, and farther in, between rwick and Tönning by stick beacons. The buoys in the are left out during winter, but for those inside the Drögden s of wood are then substituted, on account of the ice.

1. To make the Eider from the westward, Helgoland light- should be kept bearing W.N.W. ¼ W. until lost sight Near the mouth of this river, the depth is 5 to 6 fathoms coloured sand, with shells and sleek, whereas farther to the northward the soundings are gray sand. With St. Peter beacon in one with Tating Church, and the light-vessel bearing east, you are at the outer buoy, which is black, with a broom and a basket on a pole, and lies in 5¼ fathoms, on the extremity of the Fiegen Plaat. Coming from the northward, you should *Approaching the Eider from the Westward, from the Northward,*

not approach the shallow within a depth of 4½ fathoms, and not bring Tating Church and the beacon in one before the light-vessel bears in the above-mentioned direction. During a flood-tide, it should be observed, not to bring the light-vessel to the northward of E. ¼ S. before you see the buoy, for the first part of the flood sweeps to the S.S.E., across Blauort Sand.

Approaching the Eider from the Southward.

1072. Vessels coming from the southward should pass by the lead across or outside the outer shallows of the Buschsand and Blauort Sands, guided by the beacon on Buschand Polln and by the yellow buoy in the Süder or South Piep, until reaching the deep-water channel in the mouth of the Eider, when the course may be shaped for the light-vessel. From the outer black buoy an east course leads directly for the light-vessel; but during a flood tide you should steer a little more to the northward, so as to pass close to the southward of the outer white buoy, which may be distinctly seen. You should pass close to the northward or southward of the light-vessel, and then steer E.S.E. ½ E., for 3 miles, to the only red buoy in the river, placed at the Drögden; passing besides the two buoys mentioned above, two white buoys on the north shore and four black buoys on the south shore, with pretty steep shallows on both shores, on account of which you must not come inside the buoys, more particularly as two spits of the sand extend to the westward from Blauort, on the inside of which there are indentures with deep water, but shoaling towards the dry sand. From the red buoy, placed in 24 feet water S. by W. ½ W. from St. Peter beacon, and S.S.W. ½ W. from Tating Church, the course is E. ½ N., changing gradually to N.E. by E. ½ E. and N.E. by N. across the Drögden, this being the shallowest place in the Eider between the white buoy No. 8, and the black buoy No. 10, the depth being 7 to 9 feet and the channel scarcely a cable's length wide. On both sides of this bar there are buoys, the positions of which are changed when the shifting of the sands require it.

Drogden Bar.

Drogden Channel.

1073. In entering, keep close to the southward of the red buoy, for the flood tide sets strongly towards Weslingburen Loch; likewise in the Drögden keep close to the white buoys, as the flood tide sweeps across the bar, towards the Hinnerk Sand. Having passed this bar the channel trends N.E., between the shallows Linnen Plaat and Hinnerk Sand, with buoys on each

side in 4 to 7 fathoms water in a breadth of a third of a mile, with steep shallows on the south side, until between the white buoy No. 9, lying at the south-east end of Linnen Plaat in 2 fathoms water, with St. Peter beacon N. ¼ W. and Weslingburen church E.S.E. ¾ E., and the black buoy No. 11, on the opposite side of the channel, which from thence bends round to N. by E. ½ E., through the South and North Racks, with not less than 3 fathoms water, to a distance of 2½ miles. This part of the river, particularly the North Rack, is difficult to pass, unless favoured by a leading wind, as the flood tide, when the shoals are covered, sweeps across the narrow channel, towards the shallows off the Ditmarsch Ground, which shallows are steep-to. Having passed the South and North Racks, the direction of the channel is N. by W., N.N.E., and E.S.E., across a bank between the white buoys No. 13, 14, and 15, and the black ones No. 15, 16, and 17, with a depth of 10 to 17 feet for the breadth of 1 to 2 cables' lengths; the shoalest and narrowest part of this channel, called Peter Carstens Loch, opposite to the white buoy No. 12, has a depth of 10 feet at the lowest water. The S.W. end of the bank on which the white buoys are placed, is connected with the dry Schweden Plaat; and in an E.N.E. direction, it is connected with a sand-bank extending to the westward from the point of Wollerwick dike, through a sandflat only covered with 3 feet water. To avoid this bank, keep close to the black buoys No. 16 and 17, on the south side of the channel and along the Ditmarsch shallows, on which are placed stick beacons, until having passed the last white buoy, No. 17, lying in 2½ fathoms, on the south side of the above-mentioned bank, at a sand-spit extending off Schwampelhörn; then steer E. by S. until Kating Church is in one with the dike point, when the course is E. by N., nearly in the direction towards the church. Abreast of Wollerwick there is a good roadstead or stopping-place to await a change of wind or tide, and from thence the channel is only 2 cables' lengths wide, with 4 to 7 fathoms water close along the dike, until past Schwampelhörn, having on the south side 2 black buoys, of which the last one, No. 22, and carries a broom, lies in 12 feet water, at the entrance of Purren Ström, and S. ½ E. 3 cables' lengths from the outer pit of Schwampelhörn Sand, on which stands a beacon. Between Nos. 19 and 20 black, stand stick beacons along the Ditmarsch Shallows, and a

North and South Racks.

Wollerwick Road.

black buoy, No. 21, carrying a broom, is placed in 3½ fathoms, farther to the eastward. At No. 22 buoy, the channel is only a cable's length across, with 14 to 16 feet water; during a flood tide keep close to the northward of the buoy, in order to avoid being carried to the northward of the sandbank in an indenture extending nearly to Katingsiel.

Purren Ström. 1074. The interval between the last black buoy and the town of Tönning is called the Purren Ström, and curves from S.E. by S., to E.S.E., E.N.E., and N.E. by E.; it is a little more than a cable's length wide, with a depth of 3½ to 4 fathoms, and steep shallows on both sides, marked by stick beacons. The western beacon on the south side stands S.W. from Kating Church, and carries a trellis on its top. At 2 miles from Tönning there are 14 to 16 feet water, but farther in, 5 to 6 fathoms close to the dike, the depth increasing as you advance; and in the road abreast of the harbour the depth is 3 fathoms at ordinary low water.

Tönning Harbour. 1075. Close outside of the entrance to Tönning Harbour lies a mooring-buoy; the inlet commencing N.N.W. through the dike, and then turning W. ⅔ N., W.S.W. and N. towards the sluices. The harbour is well secured by piers, bulwarks, and mooring piles; it has a shipyard, and also a slip on which vessels may be hauled up and repaired. Its depth in the middle varies from 6 inches to 2 feet, at ordinary low water, but along its sides it is then 2 feet dry; however, the bottom being sleek, vessels are not in the least injured by being left dry at low water. At high water the depth is 10 feet in the middle of the harbour, and therefore admits vessels drawing 8 to 9 feet.

Alte or Old Eider. 1076. Between the white buoy No. 1 at the mouth of the Eider, and the light-vessel, you may steer E.N.E. across the bar, at half tide; this bar is formed by the shallow from Fiegen Plaat, which is connected with the tail of Hinnerk Sand, and its least depth at low water is 5 feet; when Weslingburen Church bears E. by S., the depth in the Alte, or Old Eider, is 2½ to 3 fathoms, and you may steer this course towards the church until arriving at the white buoy No. 8, lying at the southern spit of Linnen Plaat, and then proceed farther in between the buoys. During a flood tide you should steer a couple of points more northerly across the bar. This passage is much frequented during settled weather and smooth

water in preference to passing across the Drögden, but with the least breeze of westerly winds the surf spreads over the bar.

1077. Sandloch Inlet likewise affords access from sea into the Eider, between the shallow of St. Peter and the dry sand-banks to the southward; but it is only during settled weather practicable even to small craft, as the depth at low water is but 3 feet, on the outer bar, as well as where it joins the Eider, between the white buoys No. 13 and 14. In consequence of this shallow water the ebb loses its volume and its velocity, and tends still more to diminish the depth on the bar. When standing for this inlet, while outside the shallows in 4 fathoms water, St. Peter beacon should be brought to bear E. by N, and the light-vessel S. ¼ E.; by then steering E. ¼ S. the water gradually shoalens to 3 and 2½ fathoms; and when the light-vessel bears S. by W. ¼ W. the depth will be 2 fathoms, and the distance from the western extremity of the dry Hitz Ground five-sixths of a mile. From hence steer S.E. by S. across the bar, on which there are only 3 feet water in a breadth of 2 cables' lengths; but use the lead continually. When St. Peter beacon shows outside Tating Church, you are inside the bar in 9 feet water, and from hence the course through the channel is S.E. by E. and E.S.E., in 15 to 19 feet water mid-channel between the shallows. When St. Peter beacon just shows outside St. Peter church, the Channel runs E. ½ N. and N.E. by N., with a depth of 18 to 23 feet; and farther in N.N.E. close along the Koller Sand forming a narrow gut with 14 to 24 feet, until the black buoy No. 16 bears S.E. You may then shape a course for the Eider, to the northward of the white buoy No. 13, across the bank, on which, as mentioned above, the depth at present is only 3 feet at low water, and which is more likely to diminish than to increase. *Sandloch Inlet.* *Koller Sand.*

1078. From the bending of the Eider along Koller Sand, the *priel*, or little channel of Ehstersiel, with a depth of 9 feet at common high water, trends N.N.E. and N. towards the dike, on which there is a sluice forming a harbour for small craft; the stick beacons along this inlet should be kept to port in entering. *Ehstersiel.*

1079. From the beacon, standing to the eastward, 4 cables' lengths from the projecting point of the dike to the westward of the village Kating, another priel twists from N.N.E. to E.N.E., *Katingsiel.*

then N.W. and N. towards the sluice at Katingsiel, but it is pointed out by stick-beacons, which should be left to port in entering; the mid-channel of the priel forms a harbour, in which there are 9 feet at high water, but along the piers on both sides only 4 feet.

Schülpersiel. 1080. From the Purren Ström, with Kating Church bearing N.W. by N., a priel, with 8 to 9 feet at ordinary high water, takes the course of S. by E., S.E. by E. and S. towards the outer dikes, and thence S.S.W. ½ W. towards the sluice which forms Schülpersiel Harbour, admitting vessels drawing 5 to 6 feet; 40 to 50 stick beacons stand along the west and south side of this inlet. The beacon above mentioned carries an iron vane with the inscription, Schülpersiel, and the beacons standing at the bendings at the point of the sand carry brooms. This creek being in some places very narrow, it is necessary to keep close along the beacons. The harbour has no piers, and is unsafe during gales from S.W., W., and N.W.

Port Charges. The beacon money is 6 sc. Hamburg currency for vessels less than the burden of 6 com. lasts, and 12 sc. for larger ones.

1081. The navigation farther up this intricate river, from Friedrichstadt to Rendsborg, is difficult, and is more frequently performed by tracking the vessel along, than by using sails. The size of the vessels which are able to pass through the canal depends on the locks, which are—91 feet long, 24 feet wide,* and having a depth of 8¾ feet.

Lower Eider. 1082. The Lower Eider from Tönning to Rendsborg is in general practicable to vessels drawing 10 to 11 feet. The shoalest places are in the Breiholz Reach, where, from a continuance of easterly gales, the water may fall 6 feet.

Buoys. The channel is marked by the following buoys:—

1. At the reef of Kringelrug, 2 black buoys.
2. At the point between Lauenburger and Kiwitsmorer Rocks, 2 white buoys.
3. At the point between long Baakenort and Bergewörden Racks, 1 white buoy.
4. At Süderstapel, 3 black buoys.
5. In the Steinschleus Rack, 1 white buoy.
6. In Koch Rack, 1 white buoy.

* 95 Feet by 25 English.

7. In Bargener Rack, 2 white buoys.
8. In Bergenwerdiner Rack, 1 white buoy.
9. In Scheppern Rack, 2 white buoys.
10. In Thielenburg Rack, 1 white buoy and 1 black buoy.

The white buoys are on the Slesvig and the black ones on the Holstein side.

Friederichstadt Harbour has a depth of 10 to 12 feet, and Rendsborg Harbour 11 feet at high water. *Friedrichstadt.*

1083. In the Upper Eider, from Rendsborg Harbour to Föhrde, at the entrance of the canal, the depth is in general 15 to 16 feet, except at the powder magazine of Rendsborg and at Föhrde, where it is only 8½ feet, being thus somewhat less than the depth in the canal, which is 9 feet. *Upper Eider.*

1084. The Norder and Süder Piep* are inlets leading from sea into the Eider, between the extensive shallows to the westward of the shore of Ditmarsch to the harbours of Büsum, Warverort, Wöhrden, Meldorf, and Barlt: both of these inlets have at their entrances a sufficient depth for large vessels, and thus afford anchorage and shelter. *Norder and Süder Piep.*

As a guide to them a beacon 47 feet high, consisting of a post, with four supporters, carrying on its top a triangle of trellis, the sides of which are 6 feet long, is erected on Buschsand Polln, a sand-bank which is dry at common high water and rises from the outer shallow between the Süder Piep and the Norder Elbe; from this beacon Newerk high lighthouse bears S.W., and Busum church E. ¼ N. Likewise, on the shallowest spot of Blauort Sand, there is a pole erected of the same height as the former, with four supporters, and carrying on the top a 6-feet cube of trellis. This beacon stands nearly N.E. from Buschsand beacon and S.E. ⅜ E. from the Eider light-vessel. There is also at the western dry spit of this sand, a steeple beacon with two brooms, from which the Eider light vessel bears N. by E.; and 2 miles farther to the eastward, another steeple beacon is placed on the south side of Blauort Riff; from hence stick beacons with brooms stand along the north side of the channel as far as Meldorf harbour. *Beacons.* *Buschsand Polln.* *Blauort Sand.*

The Osterman Loch, which formerly led across Blauort Sand from the Norder Piep into the Eider, is now filled up. *Osterman Loch.*

* See Chart of the Entrance to the River Elbe.

Süder Piep Buoys.

1085. In the Süder Piep there are 11 buoys, and 1 buoy on a wreck, viz. :—

On the south side a yellow or flame-coloured buoy, being the outermost on the shallow from Buschsand Polln, in 5 fathoms at the very lowest water, and N.E. ¼ E. from the outer light-vessel at the mouth of the Elbe.

Three black buoys, No. I., No. II., No. III.A, and No. III.B, along the shallow from Buschsand Polln Steert (tail); No. I. is placed in such a manner that vessels, coming from the southward and steering for it, may stand across Buschsand Polln Flat, in 7 feet at low water.

One black buoy, No. IV., with an iron rod and ball, at the west end of Bielshöven Totel, at the centre of the Flack Ström; and farther in, lies the last black buoy No. V. in 4 fathoms, on the tail of the sand, extending westward from the Mittel Plaat; this buoy lies E. ¼ S. from No. IV., with Büsum church E. ¼ S. and Blauort beacon N.N.E. A green buoy, carrying brooms fixed in the form of a cross, is placed on the wreck of the Manchester steam-vessel.

On the north side, the white buoys are placed as follows :— A, at the west end of the Mittel Plaat, where the Norder and the Süder Pieps branch off in different directions; B, at the shoal called the Mittel Plaat Trindel; C, at the southern edge of the Mittel Plaat, opposite to Bielshöven, with Büsum church E. ¼ S. and Blauort beacon N. ½ W.; and D, at the east end of the Mittel Plaat, where the Norder and Süder Piep again unite.

Soundings.

1086. It is stated in Art. 1071, that the bottom in the mouth of the Eider is sleek, but to the southward of the outer buoy it is sand on the flat from Blauort Polln, which should not be approached within 4 fathoms; immediately to the southward of this flat, there are 7 to 8 fathoms, sleek and black clay in the Süder Piep. Still farther to the southward, the bottom is again sand, on the flat from Buschsand Polln, and farther to the southward, sleek in the North Elbe, then sand on the flat from Vogel Sand, until in the mouth of the South Elbe, where the bottom everywhere is soft.

By paying a minute attention to the soundings, and to the bearings of Helgoland, or of the light-vessels in the Elbe and Eider, and a lookout for both the Buschsand Polln beacon and

the large tower of Neuwerk, you will, provided it is clear weather, be able to shape a proper course for the Süder Piep.

1087. Vessels from the Elbe, bound to the Süder Piep, should steer across the flats projecting from Vogel Sand and Buschsand Polln, close to the westward of the yellow-coloured buoy, according to the draught of the vessel; but during a flood-tide, the large tower on Neuwerk must not be brought more to the westward than S. ¼ W. Having ascertained that the vessel is in the deep-water channel of the Süder Piep, you may stand in. *Süder Piep from the Elbe;*

1088. Vessels from the northward may pass across the outer part of the flat from Blauort Polln, in 15 feet water, minding not to come more to the eastward than on the mark of Tating Church, in one with St. Peter beacon, before the light-vessel bears E.N.E. ¾ E.; then the course is S.E. by E. ½ E. into the inlet, between the white buoy, A, at the west end of the Mittel Plaat, and the black buoy No. 2. *from the northward;*

1089. Coming from the westward, Helgoland lighthouse should be kept N.W. ¾ W., while it is visible, and when the outer light-vessel in the Elbe bears S. by W. ½ W., 6 miles distant, and Buschsand Polln, S.E. by E. ½ E., steer E. by S., rather easterly during a flood tide, and rather southerly during an ebb tide; those courses lead to the northward of the yellow buoy, mid-channel in 8 to 8½ fathoms water, sleek and muscle shells. If the weather is sufficiently clear to see the Eider light-vessel or Neuwerk tower, continue the above-mentioned course until the light-vessel bears E.N.E. ¼ E., or the tower S. ¾ W., when you will be a mile outside the narrowest part of the mouth, and may steer S.E. by E. ½ E. into the inlet, to the northward of the black buoys, Nos. I., II., and III.A, across the bar to the Norder Piep; the bottom consists of sleek and muscle shells, and is steep-to at the depths of 1 fathom on the south side, and of 3 fathoms on the north side. When working, do not stand nearer than into 5 fathoms on the south side, and on the north side you should not stand in on the bar that borders the Norder Piep, as the flood tide sweeps towards that inlet. Tating Church, open to the westward of Eider light-vessel, is the mark for the westernmost point of the Mittel Plaat, at which is placed the white buoy, A. *from the westward.*

1090. Steering as above directed, S.E. by E. ½ E., you pass the black buoy No. III. A, and when the light-vessel bears *Mittel Plaat.*

N. by E. ⅝ E., you are to the southward of the outer dry bank, called the Mittel Plaat Trindel, off which lies the white buoy, B, and the edge of which shoal is steep-to; on the south side, the water shoalens more gradually towards the northern edges of the shoals Buschsand and Buschsand Polln, which are uncovered; and there lies the black buoy No. III.B, in 4 fathoms, E.S.E. ½ E. from No. III.A, with the beacon on Buschsand Polln bearing S. by E. ½ E. Then steer E. ½ S., to the northward of the black buoy, No. IV., on Bielshöven Tötel, but during a flood tide you should keep somewhat more northerly, on account of the tide sweeping to the S.E. into the Flackström. Having passed the buoy No. IV., steer east, southerly, between the Mittel Plaat and Mittel Ground, passing to the northward of No. V., and to the southward of the white buoys C and D. In this channel the depth decreases gradually from 7 fathoms to 20 feet, and at the buoy D, where the Norder and Süder Pieps unite, there are only 10 feet water. Stick-beacons are placed along the south side of the channel, and having passed the buoy D you are in the Norder Piep in 6 to 7 fathoms water; with a flood tide and a light breeze, you should steer an E. by N. course until the first beacon at the inlet to Büsum is in sight, when you may steer directly for it.

Norder Piep. 1091. From the mouth of the Süder Piep, the course is N.N.E. towards the Norder Piep, across a bar with 18 to 23 feet water, and a breadth N. and S. of only 2 cables' lengths. You must keep to the westward of the white buoy, A, on the west end of the Mittel Plaat, on the mark before mentioned. To the northward of the bar, the depth soon increases to 4 and 5 fathoms, and from thence you may steer E.S.E. ½ E. into the channel, to the southward of Blauort Riff or Sand. Vessels coming from the Eider, with the intention of entering the Norder Piep, may, after having passed the black buoy No. 2, in the mouth of the Eider, steer S.W. with the first part of a flood tide, and stand across the flat from Blauort Polln, on which there are 9 feet water, by attending to the lead, and not bringing the light-vessel to bear to the northward of E.N.E., before the flat is passed, which will be known when the depth increases to 4 and 5 fathoms, and then you may steer in as above directed. You should keep along Blauort Sand, which is steep-to, and on which the two steeple beacons, mentioned in Art. 1084, are standing, and when

he light-vessel bears N.N.E. $\frac{3}{4}$ E., and the Blauort Sand beacon E., keep a little to the southward, so as to have 5 to 6 fathoms water, until the beacon bears N.E.; here the breadth of the channel N. and S. is only a little more than 2 cables' lengths, with a depth of 7 to 9 fathoms, and steep shallows, particularly at the southern spit of Blauort Sand, where the beacon stands. From hence, steer S.E. $\frac{1}{4}$ E., 5 miles towards Büsum priel or harbour, between the north side of the Mittel Plaat and the south side of the Kleine Blauort, and Büsum Henrick shoals, on which stand 8 beacons to indicate the direction of the channel; but these sands being steep-to, you should not come within 1 to 2 cables' lengths of the beacons; the depth in the channel, which is a third of a mile across, is 5 to 7 fathoms.

1092. The last beacon on the south-east side of Büsum Henrick Sand, is at the entrance to Büsum harbour. During a flood tide, which sweeps up the Miele river, you should, on approaching the beacon, hug the northern shore; the eastern mill at Büsum, kept close outside the easternmost house of the village, is the mark for entering close round the beacon, which, as well as the rest of the beacons, should be kept to port in entering. The entrance first leads N.N.E. $\frac{1}{4}$ E., then E.N.E., and E.S.E., with 2 to 4 feet water; with a common low water, at 2 cables' lengths to the southward of the southernmost point of the dike, it takes an abrupt turn towards N.N.E. and N.E., until the harbour is open to view, when the course in is N.W. On the north side of the harbour there are mooring posts. *Büsum Harbour.*

The depth at common high water is 8 feet, and, therefore, it may admit vessels drawing 7 feet, but at low water they are left dry on the sleek bottom. By means of a sluice, the harbour is kept clear, and, consequently, vessels are less comfortable here than in the entrance, abreast of the third beacon, where the shallows afford shelter.

1093. The Miele Fluss, or river, being a continuation of the Norder Piep, to the eastward, and afterwards to the southward along the coast, gives access to the harbour of Warverort, Wöhrden, and Meldorf. From the entrance of the Elbow beacon, at the narrow channel leading to Büsum, the reach of the river continues S.E. by S., and the next E.N.E., between the shallow from the shore and Stötter Spit, with a depth of 4 to 6 fathoms, and a breadth of 3 to 4 cables' lengths; and on the south side, the *Miele River.*

edges of Helmsand Steert are steep-to, though some projecting necks of this sand extend towards the deep-water channel.

Along the north side, on the dry edge of the shallow from the shore, stand 8 stick beacons, to indicate the direction of the channel between Büsum and Warverort. At the last beacon, which points out the inlet to Warverort and Wöhrden, the channel is only a cable's length across, with a depth of 10 to 12 feet; and on both sides shallows, which are steep-to. You are then just abreast of the northernmost spit of Helmsand Steert, and from hence the channel trends S.E. by E., and S.S.W., between this sand and the shore, and terminates with a depth of 4 fathoms at the priel to Meldorf harbour. Along the shallow from the shore, between the inlets to Wöhrden and to Meldorf harbours, stand 5 beacons, which should be kept to port.

Warverort Harbour.

1094. From the above Elbow beacon, the inlet branches off to Warverort harbour, being two-thirds of a mile long, first N.N.E., and then with several sinuosities, which make the navigation difficult. The small beacons standing on the western side of the inlet, should be kept to port. Outside the sluice, the harbour is formed between two wooden piers of short extent, and a few posts, to make fast to, are placed along its edges. The depth at ordinary high water is 8 feet, and therefore may admit vessels drawing 6 feet.

Wöhrden Harbour.

From the same beacon, the inlet to Wöhrden branches off E. by N. for a mile, and then E., E.N.E., and E.S.E., towards the new harbour in front of the sluice, which is distant 2 miles from the beacon. Along the north side of the inlet, there are small beacons, which should be kept to port; and vessels drawing 5 feet may use this harbour, but it is difficult to leave with westerly winds. Since König Christian Koeg has been surrounded with dikes, vessels may load or unload there, but the custom-house is at Wöhrden.

König Christian Koeg.

Meldorf Harbour.

1095. Off the inlet to Meldorf harbour there is a good road and shelter with all winds, in 7 to 10 feet water, along the shallow from the shore, and in 20 feet along Helmsand Steert. The channel to the harbour branches off S.E. by S. from the point or elbow beacon, a distance of $1\frac{1}{3}$ miles, with a depth of 3 to 4 feet along its north side, where 4 stick beacons which stand on the dry sand are to be left to port. During a flood tide, mind to keep close to the beacons, as the shallow from Elbersbüttel Steert

Elbersbüttel Sands.

is very steep-to. On the last of these beacons, a mark is shown to indicate an anchorage, where vessels at low water are left dry on the sleek; from thence the inlet lies S.E. and E.S.E. a third of a mile, with beacons on its north side; farther in it is dry at low water, but lying in a northerly direction close to the shore outside the dikes, and then E.S.E. towards Meldorf Church, and forming, before arriving at the mouth of the harbour, two abrupt turnings, which are a great annoyance in going in or out; the stick beacons are placed along the north side of the inlet. Recently the harbour has been improved by tolerable wharfs and mooring posts. The depth in the middle of the harbour is 10½ feet, and will therefore admit vessels drawing 9 feet.

1096. The narrow inlet, Kron Loch, which led between Helmsand and Elbersbüttel Steerts, is now entirely filled up, and the two steerts form one level shoal, so that there is no passage to the southward of the inlet to Meldorf; however, a new channel from the Meile river has cut its way through Helmsand, to the southward of the steert of that name, with the considerable depth of 20 to 40 feet water. This change has gradually taken place since 1845, from which period König Christian Koeg has been surrounded with dikes. *Kron Loch.*

1097. The Flackström leads S.E. from the Süder Piep; at the black buoy No. IV., which carries a ball on an iron rod, off the W. point of Bielshöven Tötel; from a third of a mile to the westward of this buoy, steer S.E. by S., so as to leave the buoy to port; and the water will shoal from 5 to 3 fathoms, which is the least depth on the bar between the north end of Busch Sand and Bielshöven Tötel. In order to avoid the patch of sand projecting from the north end of Riesen Sand, keep as close to the buoy as possible, and pay attention to the lead. Having passed the bar, the depth soon increases to 4 and 4½ fathoms, and the channel will turn to S.E., S., and S.S.E., with 3 to 4½ fathoms; but the shallows are steep, particularly towards the Riesen, on the north end of which stands a guide beacon with two brooms, and farther in two road beacons, each with one broom. The north-east side of this shoal is marked by five stick beacons, along which there are 2 and 2½ fathoms water in the channel, which terminates at the last beacon, on which there are likewise two brooms to indicate the inlet to Dicksand Priel. However, the best roadstead is between the second and third beacons from the above- *Flackström.* *Riesen Sand.*

mentioned guide beacon, where the depth is 8 to 9 feet at low water.

Anchorages. 1098. 1. In the Flackström there is anchorage for large vessels, and shelter even with westerly gales, from the Riesen, Buschsand, and Buschsand Polln sands, which are dry at common high water and only covered in extraordinary storms. However, as the Buschsand and Buschsand Polln have during the last few years been of less height above water than formerly, the anchorage in the Flackström is not now so safe.

2. In the Süder Piep you may anchor in a convenient depth, according to the draught of the vessel, on the flat of Buschsand, and lie sheltered against all winds from W. round by S. and E. to E.N.E. Vessels drawing less than 4 feet may, at three-quarters flood, run by the lead along the east side of Buschsand Polln and anchor between that shoal and Buschsand, where they are left dry on the sleek at half tide and well sheltered against all winds, even westerly gales, as long as the sands outside are above water.

3. To the N.E. of the buoy in the Flackström, in the bay formed by the Mittel Plaat, you may anchor according to the draught of the vessel in 3, 2, or 1 fathom at low water, sheltered against north and easterly winds; but those from the westward produce a high surf.

4. Farther in the Süder Piep you may anchor anywhere to the southward of the Mittel Plaat; but with westerly winds against an ebb tide the sea is rather rough.

5. With southerly winds there is a good road for large vessels in Miele River, off Helmsand Steert, and with northerly winds on the flat from the shallow to the southward of Büsum, with the church of that village bearing N. $\frac{1}{8}$ E. The tide is much stronger in mid-channel than on the shallow.

6. In the Norder Piep, after having passed the beacon, you may anchor off Blauort sand in 4 to 5 fathoms, sheltered with N.E., N., and N.W. winds; but the strong tides and an abruptly-sloping ground render it an indifferent road.

1099. The wide opening from the sea between the north side of the Vogelsand, and the flat of Buschsand Polln, divides into two

Falsche Tiefe branches; the northernmost called the Falsche Tiefe (False Channel) skirts the north sides of the Trindel and Gehlsand, and shoalens to dry between the Norder Gründe and Marner Sand, and is,

therefore, dangerous to vessels, which in thick and unsettled weather mistake this inlet for the Norder Elbe.

1100. On the contrary, its southern branch, called the Norder or North Elbe, is of much consequence to navigation, a channel having been recently formed by the effect of the tides of the river Elbe, which, sweeping across the Vogelsand, have opened a channel of 4½ to 8 fathoms between the Vogelsand, Trindel, and the opposite sands of the Gehlsand. The five following buoys are placed in this inlet. *Norder or North Elbe.*

On the north side—a white buoy, A, at the western spit of the Trindel in 3½ fathoms, with the beacon on Scharhörn Sand S.W. by S., and Neuwerk high lighthouse S. by W. ½ W. A white buoy, B, to the southward of the shoalest part of the Trindel, in 3 fathoms, S.E. ¾ E. from A. And thirdly, a white buoy, C, at the west point of Gehlsand, S.S.E. ¾ E. from B. *Buoys.*

On the south side—a black buoy, No. 1, at the north spit of the Vogelsand, in 7 fathoms, S.S.E. ¾ E. from A, with Scharhörn beacon S.W. by W., seen some distance to the eastward of the small light-vessel; Kugel beacon bearing S. by E. ¾ E., and Neuwerk high lighthouse S.S.W. And a black buoy, No. 2, at the E. side of Vogelsand in 4 fathoms, the Scharhörn beacon bearing W.S.W. ¾ W., and Kugel beacon S. by E. ½ E. Besides these buoys, there are also as marks not only the beacon on Buschsand Polin, but the buoys in the Süder or South Elbe, the two light-vessels, the Neuwerk and Cuxhaven lighthouses, the Scharhörn Neuwerk and Cuxhaven beacons, and the Rittzebüttel palace, besides Döse Church, and others, to be mentioned hereafter.

1101. Three miles N. by E. ¾ E. from the outer light-vessel in the Elbe, which lies nearly in the line of Neuwerk Turret, Scharhörn beacon, and Helgoland, and N.W. by N. 5 miles from Scharhörn beacon, the depth is 7 fathoms, and the bottom sand and sleek. From hence the course for the Norder Elbe is E.S.E., towards the white buoy A, at the point of the Trindel Sand. In hauling in to the Norder Elbe, so as to pass to the southward of the above white buoy, be careful not to allow the outer light-vessel to bear to the northward of west, until abreast of that buoy, in order to avoid the spits of the Vogelsand. The depth mid-channel is 4½ fathoms, and from thence the course is S.E. by E. between the black buoy No. 1, at the north spit of Vogelsand, and the *Directions for entering.*

white buoy B, to the southward of the Trindel, then steer S. by E. ½ E. between Gehlsand and Vogelsand in 5 to 8 fathoms, the deepest water being along the edge of the Vogelsand, which, however, is steep-to. In order to avoid being carried too near the Trindel you should keep the Kugel Baake (Ball beacon) well open to the eastward of Cuxhaven lighthouse, until having passed between the white buoy C, and the last black buoy, No. II., at the east side of the Vogelsand, then steer S. by E. directly for Döse Church, which is visible just open to the westward of Ritzebüttel palace. To avoid being sucked in between the Gehlsand and the N.W. spit of the Norder Grounds, you must keep the palace a quarter of the distance from Döse Church to Kugel beacon, until having passed the white buoy No. IX. you are in the Elbe, and may proceed as directed hereafter.

Passage across the Trindel Spit.

1102. Vessels standing out of the Norder Elbe, and bound to the northward, might cross the Trindel Spit by keeping Kugel beacon well open to the eastward of Cuxhaven lighthouse, in mid-channel between the white buoy on the Trindel and the black one on the north-eastern spit of the Vogelsand. When Scharhörn beacon is seen somewhat to the eastward of the inner light-vessel you should steer N.N.W. ½ W. across the sand, where the depth at low water is 11 feet, and continue on this course towards the yellow buoy placed at the mouth of the Süder Piep. The course from the mouth of the Norder Elbe to this buoy is N. by. W. ½ W.

Falsche Tiefe.

1103. When on the mark for the channel between Vogelsand Flat and Buschsand Polln, by making good an E.S.E. ½ E. course, you arrive into the Falsche Tiefe (False Deep or channel), just where the first white buoy is placed; then you should pass to the northward of the Trindel Spit and keep S.E. by E. ½ E. along the edge of this sand, which is steep-to, until being abreast of the north-east point of the Trindel in 9 fathoms, from whence the Buschsand Polln bears E.N.E. ½ E. The High Light-house on Neuwerk bears then S.W. by S, and is seen midway between Neuwerk beacons. When the Elbe inner light-vessel becomes visible outside Scharhörn beacon, you should keep to the southward towards the Trindel. It is requisite to hug the Trindel, because the tide sweeps with such velocity through the Falsche Tiefe, along the Gehlsand as to make it impossible,

during a flood tide, to pass the flat, unless able to steer S.S.W. The depth on the flat, at low water, is 12 to 14 feet, but from the recent change in the direction of the river, this depth is likely in future to be rather less. From thence pass to the westward of the white buoy, C, and also of the black floating beacon, lying in 12 feet, N.E. half a mile from C, at the north-west end of the Gehlsand, after which you will soon be in deeper water, from 4 to 5 fathoms; and having passed the buoy at the south-east point of Vogelsand, proceed into the Elbe as directed above.

1104. With Cuxhaven lighthouse bearing S. by W. $\frac{3}{8}$ W., and Ritzebüttel palace showing midway between it and the Kugel beacon, you may keep to the eastward of Gehlsand and steer S. by W. and S.S.W. across the Norder Gründe in 9 to 15 feet water; but as soon as the depth increases you should steer N.W., until being able to pass to the westward of the long spit from those Grounds. Four stick beacons are placed along the east side of the little Gehlsand, with Neuwerk high lighthouse west and Kugel beacon S.S.W. *Channel E. of Gehlsand.*

1105. In the Norder Elbe there is nowhere safe anchorage, from the strength of the tides and the abruptness of the shallows; however, in necessity you might bring up to the southward of the Riesen Sand, where the ground is more gradual, and where vessels may, according to their draught, stand in towards three beacons placed on the south point of that Sand, and find shelter against north and easterly winds, whereas those from south and south-west, with an ebb tide, produce a rough sea.

1106. We shall now describe the inner passages between the Eider and the Elbe. *Inner Passages.*

Dicksand Gatt, which formerly branched off from the Norder Elbe, between the shoals Hugger Plaat and Riesen is now entirely filled up, but a new inlet branches off from the Norder Elbe, between the two southernmost banks of Hugger Plaat, with the depth gradually decreasing from 15 feet in its entrance, to 11 and 7 feet at low water. At the entrance to this new inlet there is placed a black conical buoy carrying a broom on a pole; it lies at the western spit of the sand-bank in 9 feet water, and S.E. $\frac{1}{4}$ E. from the black floating beacon on Gehlsand Steert, with Neuwerk high lighthouse W.S.W. $\frac{1}{2}$ W., and Kugel beacon visible just open to the westward of Ritzebüttel palace, bearing *Hugger Plaat Inlet.*

S. by W.; therefore, when Ritzebüttel palace and Kugel beacon are in one, you are close outside the entrance, and may steer S.E. by E. to the northward of the buoy, and into the channel along the beacons standing on the north and west sides. When 3 miles inside the buoy, the channel trends in a curved direction N.E. and N N.E., and unites with Dicksand Priel, where, at the last beacon, there are 7 feet water, but from hence the priel trends N.N.W. and N. by W. into the Flackström, and is only practicable at high water to vessels drawing 6 feet; it is not yet pointed out by stick beacons.

Biels Loch. 1107. Biels Loch, which formerly branched off in an E.N.E. direction from the Flackström, across the Bielshöven Sands, is now entirely filled up.

From the Norder Piep there are several passages with shallow water into the Eider across the *watts* or flats, but only practicable at high water to the small craft that trade between the Elbe and the Eider; but these gullies in the sand being only marked by a few stick beacons, and subject to frequent changes, should only be attempted by those well acquainted with the localities; such passes are:—

Butt Loch. 1108. Butt Loch, a very narrow gut, dry at half tide, leading to the eastward and northward of Koegs Henrick Sand, and then N.N.E. and N.E. along the shore shallow, with a depth of 8 to 11 feet.

Becker Loch. 1109. Becker Loch, the continuation of Butt Loch, turning to the westward to Weslingburen Loch, and very crooked, lying N.N.W., W.N.W., S.S.W. and S.W., between Hinnerk and Koegs Henrick Sands with a depth of 4 feet.

Weslingburen Loch. 1110. Weslingburen Loch leading in a W.N.W. direction between the Blauort and Hinnerk shoals, with a depth of 3 fathoms in a breadth of 2 cables' lengths. This channel lies in the direction of the light-vessel, and runs into the Eider, between the black buoys No. 4 and 5. In its inner part anchorage and shelter may be found with all winds, except from W.N.W., to which it is entirely exposed, and which, during an ebb tide, occasion a rough sea.

Osterman Loch. 1111. Osterman Loch, which formerly led across Blauort Sand, and New Fahrwassen, a narrow gut to the westward of that sand, are now entirely filled up.

CHAPTER XV.

THE RIVER ELBE.

1112. In the extensive Bight of Helgoland, sometimes called by seafaring men Hamburg Bay, the indraught is considerable; the prevailing winds are from the westward, and foggy and hazy weather, arising from the low marshy land around, is very common. For the numerous vessels frequenting the Eider, Elbe, Weser, Jahde, and Ems rivers, the rocky island of Helgoland affords an excellent landmark, being admirably situated in the centre of the bay, so as to enable them to correct their dead reckoning, and at the same time to obtain a pilot. *Helgoland.*

1113. Every one ought to make this island, which is about 200 feet high, and visible in clear weather 15 miles. In approaching it during a fog, or thick weather, the Borkum Bank is useful, for the depth is only 18 to 19 fathoms, on a bottom of sand with small red stones; but on passing it the depth increases to 20 and 23 fathoms, with a bottom of sand and sleek. It then decreases a little to the eastward; and when it again deepens to 23 fathoms, and the soundings are chalk, you are close to Helgoland, on the west and south sides of which the depth is somewhat greater. *Borkum Ban*

1114. The Light, which is fixed, is visible all round the horizon. It stands in 54° 10′ 50″ N., 7° 53′ 5″ E., and being elevated 258 feet above the sea, may be seen about 20 miles in clear weather. *Helgoland Light.*

1115. During boisterous weather, with W. or N.W. winds, it is difficult, or even impossible, for a pilot to leave the island, on account of the surf; in which case you should anchor to the eastward of Sandinsel, in 7 to 9 fathoms, with the lighthouse bearing W., and as soon as the weather abates, the pilot will attend. On Sandinsel three beacons are erected, painted black, and carrying triangles; and a similar beacon stands on the south end of Helgoland. *Sandinsel.* *Beacons.*

1116. In running for the anchorage to the eastward of *Stein sunken Rock.*

Sandinsel, you must avoid a large rock called the Stein, with only 4 feet water, lying to the southward of Helgoland, and marked by a black buoy, placed a little to the westward of it, on the marks: the N.E. and S.W. beacons, on Sandinsel in one, bearing N.E. ¼ N., and the old lighthouse and beacon on Helgoland in one bearing N. ¼ W. You should pass to the southward of this rock and also of two other rocks to the eastward of it, called the Telsen, and then giving a proper berth to the reef projecting from the south end of Sandinsel into 7 fathoms, bring the north end of Sandinsel in one with the south end of Helgoland, and anchor in 6 to 7 fathoms, tolerably sheltered against W. or N.W. winds. If at night, bring the light to bear W.

Helgoland Harbour. 1117. From the indifferent shelter in Helgoland harbour, it cannot generally be recommended, the more so as the bottom in the middle is rocky. Vessels obliged to anchor there, either in cases of need or to avoid ice, should attend to the following directions:—Coming from the southward, the N.E. and S.W. beacons on Sandinsel should be kept in one, steering about N.E. until the beacon on Helgoland opens to the westward of the old lighthouse, when you will have passed the Stein, and may stand in for the anchorage, but keeping nearest to Sandinsel, where there is the deepest water. The marks for the anchorage for large ships are:—the two above-mentioned beacons on Sandinsel in one, and the flagstaff on the south end of Helgoland in one with the old lighthouse. A clear bottom will be found there, and 4 fathoms water at half ebb. When entering from the eastward, keep Helgoland beacon just open to the westward of the old lighthouse, until the two beacons on Sandinsel are in one, when you will be past the rock, and may steer for the anchorage.

South Harbour. 1118. With the N.E. and S.W. beacons on Sandinsel in one, small vessels may stand on until abreast of the east end of that island, and there anchor on a sandy bottom, in 3 to 4 fathoms at low water. The latter is called the South harbour, being separated from the other by an uneven rocky flat with 13 feet water; but this anchorage is still less sheltered than the first mentioned, although it is deeper and more spacious, and therefore moorings for the British ships of war were placed there during the last war.

North Channel. 1119. When taking the harbour from the northward,

Helgoland should be brought to bear S.E., and the island approached within a mile, but not nearer than just to keep the lantern above the ridge of the cliff. When the north end of Helgoland bears S., and the two northern beacons on Sandinsel are in one, you may on this mark steer S.E. ¼ S., until the lighthouse is in one with the church, bearing S.S.W. ½ W., and then anchor in 4 to 5 fathoms. At night, keep the light always visible above the ridge of the land, and when it bears S. by E. ¼ E., steer S.E. ¼ S. towards the anchorage, minding never to come so near the island as to hide the light from view. Keep the lead going, and do not stand nearer to the long reefs of Sandinsel than into 4 fathoms. The greatest depth is 7 fathoms. The flood tide to the southward of the island runs E. by N. and E. until half flood. *Tides.*

1120. The outer light-vessel, and the outer red buoy at the mouth of the Elbe, lie S.E. by S. from Helgoland, the former being 18 miles distant, and the buoy 19 miles. During a flood tide and south-westerly winds, you should steer a point more to the southward, and with an ebb tide and north-easterly winds a point more easterly. The depth in this track is 20 fathoms, gradually decreasing to 12, with soft bluish clay, and at the buoy 10 fathoms, fine yellow sand. With the outer light-vessel bearing not more easterly than S.E. by S., and distant 6 miles, the depth is 9 to 10 fathoms, with fine blackish sand; whereas, at the same distance with the light-vessel bearing S.E., or S.E. by E., 11 to 13 fathoms will be had on a greasy, bluish bottom, sometimes mixed with broken shells. *Helgoland to the Elbe.*

1121. Navigators acquainted with the Elbe and the Weser, do not, when coming from the westward, and particularly with a southerly wind, approach Helgoland, but merely take the bearing of it, or of Wangeroog; and when about midway between these islands, which lie N.N.E. and S S.W., nearly 23 miles from each other, they steer E.S.E. for the red buoy of the Elbe, but duly considering the wind and tide, and shaping a course accordingly. In this track the depth is 17 to 12 fathoms, with a similar clayish bottom; but nearer to the southern shore, in 10 fathoms, the bottom is hard and fine white sand; on the outer shallows between the rivers Jahde, Weser, and Elbe, the depth suddenly decreases from 10 to 7 fathoms, and a short distance farther in they dry; therefore, during night, or in thick weather, when no *Soundings off the Elbe.*

marks can be seen, you should not stand nearer the shore than in 13 fathoms, and then, if it is a flood tide, you should, if possible, anchor.

Tides. 1122. In the vicinity of the Jahde and Weser, the flood stream inclines towards these rivers; whereas farther to the northward in the bay, off the Elbe, as also between Wangeroog and Helgoland, it runs to the northward and eastward, and the ebb in opposite directions. Hence due attention must be paid to the setting of the tide, and in making any of the inlets to the lead being kept constantly going. In the mouth of the Elbe, the first part of the stream of flood comes from the southward, sweeping in a N. and N.E. direction across the Vogelsand Steert, until nearly half tide, when it runs E. and S.E. into the Elbe, following the course of the inlet; and the ebb taking the contrary direction. The time of high water at full and change of the moon in the mouth of the Elbe is 12 h.; the interval between high and low water is about 6 h. 25 m., but between low and high water only 6 h., and the vertical rise is about 11 feet.

Elbe River. 1123. In order to facilitate the approach to the South Elbe, or Elbe Ström, the main channel into the river Elbe, and to guard against the numerous and dangerous shoals at its entrance, lighthouses and beacons are erected on Neuwerk, an island distant 5 miles from the shore; and a pilot galiot and two light-vessels are moored in its mouth, and buoys and beacons are thickly spread along its whole extent.*

Neuwerk Lights. 1124. On Neuwerk there are two Fixed lights, on the bearing of N. by W. ½ W., and S. by E. ½ E., and 685 yards apart; the southernmost and highest, being 120 feet above the level of the sea, may be seen from the deck of a vessel 15 miles, the eye being supposed to be elevated 16 feet, and consequently is visible 7 or 8 miles outside the red buoy. The northern lighthouse is 60 feet above the level of the sea, and may be seen 12 miles. Besides these lighthouses, a wooden beacon, called the north beacon, stands on the north-west side of Neuwerk, and on the east side a smaller one, called the eastern beacon.

Beacons.

Scharhörn Beacon. 1125. On Scharhörn Sand, N.W. by N., distant 3⅔ miles from

* From the shifting of the sands the position of the buoys are changed, whenever such may be required; hence it follows, that neither the places of the buoys nor the outlines of the channels, as shown on the chart of the river, can be at all times correct.

the high lighthouse on Neuwerk, stands a high wooden beacon, carrying a round basket ending in a point.

1126. With the high lighthouse on Neuwerk nearly in one with Scharhörn beacon, distant about 4⅝ miles, lies the outer light-vessel, in 11 fathoms; she is lugger-rigged, with three masts, and painted red, with the word Elbe on each side; and in the same direction, about a mile inside the light-vessel, lies the red buoy, in 10 fathoms. During the day the light-vessel carries a red flag at the main, and by night a light 36 feet high. In a fog or thick weather, a bell is tolled during one minute, and also when vessels are seen in the offing; but when they are lost sight of in thick weather, fog, or snow, guns are fired occasionally. This vessel is moored to a buoy anchored by a chain fastened to an anchor with one fluke, and never leaves her station from boisterous weather, till compelled by stress of ice, but remains there as long as possible, during all seasons of the year. *Outer Light Vessel.* *Red Outer Buoy.*

1127. The pilot vessel, called the Loots galiot, lies in 10 fathoms, has two masts, and carries a large vane on her foremast; during moderate weather, her station is E.S.E., 2 miles from the outer light-vessel, or a mile E. ½ N. from the red buoy. While pilots are on board, ready to attend, the Hamburg Admiralty flag is kept flying at her main. Vessels wanting a pilot should, during the day, hoist the usual signal, but at night a lantern, and heave to at a proper distance, until the pilot comes alongside. When the galiot by stress of weather is obliged to leave her station, she will anchor farther in, between Scharhörn and Neuwerk, in the triangle between the buoys, D, No. V. and N^{t}. VI. At night she carries a lantern, half-mast high. *Pilot Galiot.*

1128. Between the white buoys Nos. III. and IV., in 11 fathoms, and off the S.W. spit of the Vogelsand, where the channel branches in two directions, another light-vessel is stationed about 4¼ miles, S.E. by E, from the outer one, N.E. ½ E. from Scharhörn beacon, and N. by W. from Neuwerk high lighthouse. This vessel is likewise supposed to keep her station during all seasons, unless obliged to leave it on account of the ice; she is painted red, with Elbe on her sides, and differs from the outer light-vessel by carrying in daylight, at the foremast head, a flag half white and half blue, horizontally; and at night, two lights, one being 35 feet, and the other 17 feet above the sea. *Inner Light Vessels.*

Both of these light-vessels having three masts, it is ordered that

the outer one should carry the red flag at the main, and the inner one the blue and white flag at the fore; but occasionally it may happen that a vessel with two masts is used on the inner station.

If these vessels show no flags, it signifies that they are not in their respective stations, and in this case the greater circumspection is necessary when entering the river.

Buoys. 1129. Besides the above-mentioned red outer buoy, at the mouth of the river, both sides of the channel are marked by buoys, those on the south side being black, and distinguished successively with letters, and those on the north side white, and marked with numbers. Besides the difference of colour, the buoys are also distinguished by different forms: thus the black are can-buoys, conical with the point downward, while the white ones are nun-buoys, pointed at both ends, and carry an iron rod with a vane to the lower end of the iron rod the mooring chain is fastened to. During the winter, the buoys inside of Cuxhaven are removed, and substituted by wooden logs, but these, not being so conspicuous as the buoys, are, in bad weather, only discernible at a short distance. The outer buoys between Cuxhaven and the red buoy remain, and additional wooden logs are placed at each of them. The marks for those buoys, at which the course changes, are,—

C, the Schar-buoy, black, and No. 1, white, lying in 8 fathoms, with the northern beacon and the high lighthouse on Neuwerk in one.

F, the vane-buoy, black, lies in 6½ fathoms, with the easternmost house on Neuwerk, in one with the high lighthouse.

L, black, lies in 4 fathoms, with Döse Church in one with Bösch-house, and the guard-house at the harbour open to the eastward of the bathing house.

Norder Gat. 1130. The buoys in the Norder Gat are checkered black and white. No. 1 lies in 5 fathoms, about S.E. by E. ½ E., 2½ miles from the inner light-vessel, and with the high lighthouse on Neuwerk in one with the easternmost house. No. II. carries a ball, and lies in 5½ fathoms, E. by S., 1¼ miles from No. 1, with the fisherman's house in one with the easternmost house on Neuwerk, and Cuxhaven lighthouse in one with Bösch-house.*

* It appears that the buoys Nos. 1 and 2 have recently been moved, but the exact position in which they are now placed, is not known.

1131. In entering the Norder Gat, between the white buoys Nos. IV. and V., you should pass to the southward of No. 1. From No. II., steer S. by E., edging to S. by W., so as to pass into the Elbe to the eastward of the buoys VIII. and IX., when a house, standing just to the westward of Kugel beacon, must be kept in one with Cuxhaven lighthouse. But observe not to bring Cuxhaven lighthouse to the eastward of the Kugel beacon, before being in the fair channel of the Elbe. *Entering the Elbe by Day.*

1132. With regard to the visibility of the buoys and beacons on Neuwerk, the most favourable times to enter the river, during the summer season, is early in the morning or in the afternoon; you are then, generally, exempted from the glaring reflection of the sun from the water and from the low sandy shore, which is so apt to dazzle the sight. In moderate weather, and with the wind free, it is better to enter the river 1½ to 2 hours after the flood has begun to make, but in boisterous weather and westerly gales you should not stand in till an hour before high water, for the water-stand then being so much higher, allows a safer passage across the shoals.

1133. In going in or out, you should avoid coming too near the openings, called Balges and Gats, lest the flood stream should sweep the vessel into them. *Balges and Gats to be avoided.*

1134. Having, as before directed, made the outer light-vessel, bring her to bear S.E. by E., and if the wind is S.W., steer past her S.E. by S., until at the red buoy; and then E. ¼ N. towards the pilot or Loots-galiot; a shorter cut is to steer E.S.E. from the outer light-vessel directly for the galiot, should she be in her usual station (Art. 1127), where you will get a pilot to take the vessel farther up the river.

But if the pilot galiot be on her inner station (Art. 1127), pass to the northward of the outer light-vessel, then steer E.S.E., until the inner light-vessel bears S.E., and then keep directly for her, leaving her to port: from thence the course is S.S.E., and S.E. by S., close to the northward of the black buoys toward the pilot galiot anchored in the vicinity of the black buoy D. On the contrary, if the wind be north or north-easterly, you should prefer keeping mid-channel, or even close along the white buoys on the Vogelsand, and pass on either side of the inner light-vessel according to circumstances, and then shape a course, about S.S.E. towards the black buoy D, to get a pilot.

When the outer light-vessel, from reasons stated above, is not

Precautions when Outer Light-vessel is not on her station.

on her station, and the buoys or logs of wood are carried away by the ice, you should approach from the mouth of the river in 12 fathoms, having the beacons and lighthouses on Neuwerk distinctly visible; then by bringing Scharhörn beacon to bear S.E. by S., and in one with the high lighthouse on Neuwerk, you will be nearly on the spot where the light-vessel usually is, and may steer E.S.E., until the northern beacon is in one with the high lighthouse on Neuwerk, when being midway between the Schar-buoy and the white buoy No. I., you may steer S.E. by S. towards the Flügel or Vane buoy, to which the pilots from Cuxhaven usually resort. The flood-tide sweeps violently towards the Norder Gat.

1135. When outside the mouth of the river, Neuwerk high lighthouse must be brought in one with Scharhörn beacon, and by continuing on this mark you will pass sufficiently near to the Red buoy to see it, if it is not carried away, and may proceed as directed above; but, in standing in, it is necessary to keep the lead going, and to pay minute attention to the relative position and bearings of the landmarks, so as not to rely exclusively on the buoys, which from the sea and current may have shifted from their proper places.

Precautions in entering the River.

1136. If the river is encumbered by ice, and the light-vessels and buoys carried away, you should only attempt the entrance, when the wind is between W. and S.W., for with northerly and easterly winds it is impossible to fetch Cuxhaven. When Scharhörn beacon is the only visible mark, bring it to bear S.S.E., and steer towards it, until being in 9 fathoms, then steer E. and E.S.E., and when the depth increases, you should again edge to the southward, and in this manner run along Scharhörn Sand in 9 to 11 fathoms, until sufficiently near to Neuwerk to see the lighthouses and beacons. Scharhörn Sand being very steep-to, it is advisable to run along it only when the wind is W. or S.W.; and if the wind be northerly or easterly, you should hug the Vogelsand side, even should Scharhörn by doing so be lost sight of: you must then be guided by the depths marked down in the chart, and by strict attention to the lead; and by taking into consideration the state of the wind and tide, but as a general rule it may be as well to state that in proceeding up the river, the buoys marked with letters are to be left on the starboard hand, and those with numbers on the port hand.

1137. If obliged by stress of weather, or if from any other cause, you prefer entering the Elbe at night, and being advanced so far into the bay that both lights on Neuwerk are visible, they should be brought to bear S.E.; then edge a little easterly, until in about 13 fathoms, with the high light S.E. by S., and steer directly for the outer floating light, which may be distinguished from the Neuwerk lights by its being steadier and fainter, and by its quick increase on approaching; whereas the lights on Neuwerk are brighter, and during a clear atmosphere may be seen much farther, twinkling like stars. *Entering the Elbe by night.*

1138. During the winter season, when it is not certain that the light-vessel is in her station, you must, when in 14 to 13 fathoms, with Neuwerk lights in sight, bearing S.E. by S., steer east, until the S.E. lights are nearly in one, or rather the high light just open to the westward of the low light, bearing S. by E. ¼ E., which is the course across Vogelsand Flat, in 5 to 7 fathoms, according as it is either low or high water. When the depth increases from 9 to 12 fathoms, you will be mid-channel, and, provided the weather be clear, will have Cuxhaven light in sight, too distant to serve as a guide while outside the mouth of the river. Being in the above depth at the first of or at half-flood, steer S.E. until Neuwerk low light is just open to the westward of the high light; then you will be on the mark for the Schar-buoy C, and may steer S.E. by S. to the Vane-buoy F, from which the high light bears S.S.W., and where there will be found good anchorage until daylight.

1139. Vessels having lost anchors and cables, and going to Cuxhaven, must be guided by the lead, and by frequent bearings of Neuwerk and Cuxhaven lights. Under such circumstances keep along the S. side of the Kleine Vogelsand in 5 to 6 fathoms until Neuwerk high light bears W. by N., and Cuxhaven light S.S.E., when you will be at the black Böschen Buoy K, and may steer S.E., S.S.E., and S., to the harbour, guided by the light which appears reddish in the direction of the buoy K. *Refuge in Cuxhaven.*

1140. Cuxhaven light is Fixed, and being elevated 80 feet above high water, may be seen 12 to 13 miles. The lighthouse is round, 66 feet high, and built of red bricks, on a spit of the shore, close to the northward of the entrance to the harbour. On the north point of the shore stands a high wooden beacon, carrying a globular top, and called the Kugel Baake, or ball *Cuxhaven Light.* *Kugel Beacon.*

beacon: it stands N. by W., 1400 fathoms, or 1·4 miles from the lighthouse.

Precautions in scant winds.

1141. With a scant and light southerly wind you cannot enter the Elbe when the Neuwerk lights are nearly in one or bearing S. by E. ½ E. Under such circumstances, when Scharhörn Sand may be approached without risk, you should look out for the low light, which from the deck of a moderate-sized vessel may be seen 10 to 12 miles, and as soon it is visible, both lights should be brought to bear a point more easterly than the above-mentioned bearing, or S S.E. ½ E., so as to have the high light well open to the westward of the low light, and with them in that direction, stand across the Vogelsand Flat, in 8 to 9 fathoms, until in 10 to 13 fathoms in the river, when you may approach Scharhörn Sand by the lead, and then steer S.E. by S. as directed above. In both cases you should avoid coming so far to the eastward while passing the Vogelsand as to have the low light visible to the westward of the high light, and therefore the lights should not be brought in one, before you are sure of being in the fair track of the river, and to the southward of the Vogelsand.

Scharhörn Sand.

1142. Ships which unfortunately ground on the Vogelsand during boisterous weather, and with W. or N.W winds, are generally wrecked without a chance of the crews being saved; whereas those who are wrecked on the Scharhörn Sand may possibly escape by repairing to the beacon, and even part of the cargo may perhaps be saved when the weather moderates.

1143. Off the Elbe there is everywhere good anchorage, and many vessels have been saved, even during heavy north-west gales, by bringing up, and cutting away the masts, in order to ride out the gale, while others by running in have been totally lost.

Entering when the Inner Light-vessel is on her station.

1144. Having passed to the northward of the outer light-vessel, steer E.S.E., until the inner light-vessel bears S.E., then steer directly for her, but pass her to the southward; and when she bears N.N.W., steer S.S.E., keeping the lead constantly going. In this track the depth will be from 13 to 5¼ fathoms; and when in the latter depth you will be in the vicinity of the black buoy E, with Neuwerk high light bearing S. by W. Off the extremity of the very narrow spit extending from the Kleine Vogel Sand, and jutting out athwart the above-mentioned course, you may, by quick sounding, get 6 fathoms, but it soon deepens

to 7, 8, and 9 fathoms. When in 5¼ fathoms, on its south side, in the vicinity of the buoy E, you should steer between N.E. and E. for a short distance; and attending well to the lead, anchor as soon as the depth increases to 7 fathoms; you are then in the vicinity of the pilot galiot, if she is on her station between the buoys D, No. V. and No. VI., and in the best anchorage. —(*See* Arts. 1127 and 1134.)

1145. If, however, both light-vessels should have been compelled to leave their stations, the greater the importance of paying minute attention to the before-mentioned directions for entering, guided by Neuwerk lights and beacons.

Light-vessels' buoys.

When the light-vessels are obliged to slip, their mooring buoys are of course left, and by day they may afford some guidance; they are Nun-buoys, pointed at both ends, and strongly bound with iron.

Eitzen Balge.

1146. The mouth of the inlet called Eitzen Balge is marked by a small red buoy, for the use of coasters: the buoy lies at the east side of the inlet, which has stick beacons along its west side.

Cuxhaven Road and Harbour.

1147. In Cuxhaven Road there is good holding-ground. Off the mouth of the harbour a kind of breakwater divides the anchorage into two parts, of which the northernmost, the Alteliebe (Old-deep), is the best, and has a depth of 20 feet at high water: from thence the entrance to the harbour lies S.W. by W., with a depth of 18 to 14 feet at high water. Should there be no room in the harbour, keep along the outside of the breakwater, and round its south end, where you will be sheltered from the ice; but the depth there is only 12 to 16 feet at ordinary high water.

Quarantine.

Cuxhaven is the quarantine-ground of the Elbe; damaged vessels may find here every kind of resource; and telegraphic communication may be made to Gluckstadt, Altona, and Hamburg.

Tides.

1148. At full and change it is high water at Cuxhaven at 1h.8m. A.M.: the ebb begins to make 1 h. 8 m. later than at the mouth of the river, and runs 6 h. 53 m.; but the flood ceases to rise in 5 h. 31 m. In Cuxhaven Road, as well as in the mouth of the river, it is never slack water, for the flood-stream continues to run three-quarters of an hour after it is high water by the shore on the south side. Between Cuxhaven and the mouth of the Elbe, the tide is stronger than outside the river. At springs the ebb runs at the rate of 3 to 4 knots, and the flood 2 to 3 knots;

the vertical rise being at springs 11, and at neaps 8½ feet; the usual rise, however, is 9¾ feet.

1149. From Cuxhaven the channel, which is buoyed, proceeds to the eastward close along the northern shore of Ritzebüttel, and then curves round from S.S.E. ½ E. to S.E., E. by S., and E., towards the projecting point of the dike at Brunsbüttel; the first part of this space, until past the white buoy No. XVII., is bound on the north side by the Kratz and Medem Sands, both of which are dry at low water, and then divides into two branches, of which the northern one, called Nordloch, and also the Klotzenloch, between Norder Grunde and the Medem Sand, are foul, shallow, and narrow, and, not being buoyed, are but rarely used.

Oste River. 1150. The Oste River, after running in a northerly direction, discharges itself into the Elbe 11 miles to the E. of Cuxhaven, between the black buoys O and P, and opposite to another black buoy midway between them, lying in 7 fathoms, carrying a ball, and marked OP. A third of a mile to the southward there are a black and a white buoy, to show the mouth of the river. Its west point is marked by a Huk beacon, and from thence to Alte Medem by 8 stick beacons, standing nearly in the direction of N. and S.; but on the eastern side there is only one buoy which watches on a wreck half-way between the mouth of the river and the town of Neuhaus. Close inside the buoys there is a bar, with 10 feet at low water, and farther in, at Alte Medem, only 8 feet; whereas between those bars there are 14 feet water, and above the innermost as much as 22 feet. During the last 30 years the mouth of the river has considerably changed, and the inner bar has been formed within the last few years.

If those buoys should be carried away, you may steer south, across the outer bar, on the mark, Neuhaus Mill, just open to the westward of the first house on the dike, and then keep along the stick beacons, leaving them to starboard. Vessels drawing 8 feet may proceed as far as Laumühlen, and those drawing 5 feet, as far as Bremerwörde. The river Oste is much frequented, and possesses about 120 vessels, of a burden from 5 to 40 commerce lasts, belonging to the inhabitants of Neuhaus, Geversdorff, Oberndorff, Kirchosten, Laumühlen, and Bremerwörde, all of which have ship-yards. Inside the mouth of the river a revenue vessel is stationed.

Revenue Vessel.

1151. Neufeld Harbour, in South Dithmarsch, has at ordinary high water a depth of 7 to 8 feet. To point out the entrance a beacon, carrying a small barrel, is placed two-thirds of a mile from the shore, with Balje Church S.S.E. ½ E., and Belum church S.S.W. ¼ W. To reach this beacon, edge away to the north-eastward from the channel, and steer away directly for the custom-house, which has a red-tiled roof, and stands on the dike at the entrance of the harbour: leave the beacon to port, and the stick beacons will lead in N. by E. along the west side of the channel to the outer shore, where the harbour commences, and thence E.N.E. along the dike. The extremity of the earthen mole, which is run out from the mouth of the harbour to prevent the inlet from being choked by mud, is marked by a beacon like the former, carrying a barrel. The harbour, provided with mooring piles, is 124 feet long and 31 wide; but during unsettled weather, when the outer shore is overflown or submerged, vessels are not safe there. *Neufeld Harbour.*

1152. Vessels loading at Neufeld harbour pay according to their burden from 8 to 24 sc.,* Hamburg currency, 4 sc. for the use of a stamped barrel to measure the corn in loading, and 1 sc. for each barrel loaded; and those from 25 to 30 commerce lasts burden are obliged to load outside the harbour. *Port Charges.*

1153. To the southward of Brunsbüttel the channel runs close along the dikes, with as much as 33 feet at ordinary low water; in consequence of which the dike here is very liable to be destroyed; and the expense of maintaining it is considerable.

From the dike, and also from the outer shore of Brunsbüttel harbour, dams are run out to the distance of 600 to 800 feet towards the deep-water channel into the river. They consist of fascines covered with stones, rising 2 to 4 feet above low water-mark, but covered at half-flood. They are marked by beacons, which are frequently swept away by the drift ice. *Brunsbüttel.*

1154. On the west side of the entrance to Brunsbüttel Harbour stands a beacon, carrying a small barrel, and on the same side of the inlet there are stick beacons along the edge of the *watt*, or the outer shore, close to the dike.

At two-thirds of a mile outside the point of the harbour dike there are 2 feet at low and 12 at high water; and a similar depth

* 16 schillings = 1 mark = about 1*s.* 3*d.* English.

will be found in the inlet which branches off in two parts, forming the old and the new harbours. The latter has two large lochs, and is the most frequented from its being very spacious and provided with quays on both sides, and with *Anlœgs* and storm-piles on its west side. During gales and at high-water, vessels here are completely sheltered by the dikes against S.W., W., N., and E. winds.

Port Charges. 1155. The fees to be paid in Brunsbüttel Harbour are: beacon money 4 to 12 scs. (Hamburgh currency) according to the size of the vessel; for every barrel of corn shipped half a sc.; and for the use of the measuring-barrel 4 scs. per vessel.

1156. From the white buoy No. XIX., being the last of those numbered consecutively, and placed at the east end of the *Oste Bank.* Oste Bank, on which there are 13 to 16 feet water, the channel trends E.S.E. ½ E. to the northward of the black buoys P, Q, R, and S, the two first of which are placed on the northern edge of *Oste Riff.* Oste Riff, lying just to the eastward of the mouth of Oste River, and separated from the low-water shore, outside the dikes to the north and west of Balje Church, by a narrow channel. The buoys R and S lie to the northward of the Bösch Rücken, which dries at low water and extends 3 miles in an E.S.E. direction: this sand-bank is somewhat to the southward of the mid-channel, and appears to be the continuation of Sandort Spit, though separated from it by a passage with 16 feet water.

Sandort Reef. 1157. Sandort Spit projects about 2 miles N.N.W. ½ W. from the outer shore of Freyburg. The channel called South Priel, to the southward of Bosch Rücken, has from 3 to 6½ fathoms water, but only 16 feet in the gap as above stated, and it is not provided with buoys, the black buoy S being the last of those marked with letters.

1158. From Brunsbüttel to the eastward, the bed of the river has a tolerable depth, and is steep-to close to the foot of the dike; along Brunsbüttel-new-koeg the water is shallower abreast of the outer shore off Bösch; but off the point of the dike to the westward of Hölzernhöft, and to the eastward until near the point of the dike to the westward of Brockdorf, the bed of the river has a depth of 23 to 27 feet at a cable's length from the dike, and 7 to 15 fathoms in the deep-water channel. The Reach between Brunsbüttel and Stör River, or between the black buoy R and *Freyburg Road.* No. 27, is called Freyburg Road.

Bösch Harbour. 1159. At Bösch, which is a pilot station, a signal lantern is

lighted by the pilots when the river is free from ice. At the mouth of the inlet, N. by E. from the black buoy S, placed on the mark, Bösch mill in one with the pilot-house, there is a depth of 8 feet at low water, but farther in it decreases to 3 feet at 3 cables' lengths within the outermost point of the outer shore. Just to the eastward of the latter, the small inlet forming St. Margareten harbour empties itself into the river: this harbour is dry at three-quarters ebb. *Pilots, and Light.* *St. Margareten Harbour.*

1160. The black buoy No. 27 is the outermost of the buoys lying to the westward of Blankenese, and is placed at the north-west spit of Aussen Brammer shoal, which extends N. by W. ½ W. along the south side of the channel, though separated from the shore by a narrow channel with 8 to 15 feet water, but not buoyed. Besides this buoy, No. 27, the east side of the shoal is marked by the buoys Nos. 26 and 25; the black buoy No. 24 lies at the mouth of the South Elbe, an inlet with 5 to 10 feet water, separating Kraut Sand and Hamelwörden, and trending in a curved direction from S.W. by W. to S.S.E. ½ E. to the southward of Kraut Sand and Mühlenhafen, where it dries. E.S.E. ½ E. from the buoy No. 24, on the north side of the channel, lies No. XVII., the outermost of the white buoys placed from Finkinwärder to the westward, and which are numbered consecutively. *Aussen Brammer Shoal.* *South Elbe Inlet.*

1161. From the black buoy S, the course up the river is S.E. until midway between the two last-mentioned buoys, and from thence the channel, with a sufficient depth for large ships, becomes narrower, and in some places crooked, and therefore the buoys are placed at shorter distances from each other. The course is S. ½ E. mid-channel between both ranges of buoys, to the southward of Gluckstadt Bank, until at the white buoy No. XV., and from thence S.S.E. between the white buoy No. XIV. and the black one No. 21, of which the former lies at the north-west spit of Colmar Sand, and the latter at the north-west spit of Tonnen Sand, the edges of which are likewise marked along its north and east sides by the black buoys, Nos. 20, 19, and 18. The channel lies to the eastward of these buoys changing gradually to S.S.W., and farther in to South until past the white buoys Nos. XII. and XI.; from thence the channel again inclines somewhat more easterly, until between the white buoy No. X. and the black one No. 16, when it bends to S. by W. ½ W. *Gluckstadt Bank or Rhin Plat.*

between the two next buoys, and from them S. ½ E. to the white buoy No. VII., placed to the northward of the revenue vessel stationed off Stade. The above-mentioned white buoys lie at the west side of Pagen and Wolf Sands, which form the eastern boundary of the channel. The shoalest water, 19 feet, in this part of the channel, is between the black buoys, Nos. 19 and 18; and on its east side a buoy is placed at the spit of a shallow neck of sand, extending in a north-westerly and northerly direction from Wolf Sand as far as mid-channel, between the Tonnen and Pagen Sands.

Pagen and Wolf Sands.

Asseler Sand. 1162. The channel between the Tonnen and Asseler Sands is not provided with buoys. Asseler Sand is separated from Kraut Sand and the shore by the Ruthen, a narrow passage, with only 4 to 10 feet water.

Ruthen Pass.

That branch of the river between Pagen Sand and the shore of Holstein has at ordinary low water 2 to 4 fathoms: it may, therefore, sometimes be preferable for large ships, as the flood-tide continues there longer than in the western channel, which is marked by buoys. But the depth in this eastern channel being subject to frequent changes, large vessels should not attempt it without a pilot.

Stör River. 1163. Off the south point of the river Stör a black buoy lies in 8 feet at ordinary low water, with the lighthouse on Ivenfleth dike, bearing E. by. S., and Wewelsfleth Church N.E. ½ E; in a N.E. direction from this buoy a white one is placed at the northern edge of the channel, along which there are also several stick beacons. These buoys and beacons are kept out as long as the ice will permit. The depth on the bar to the northward of the black beacon is at present only 5 to 6 feet at ordinary low water; but the common rise of the tide being 8 to 9 feet, vessels drawing 13 to 14 may pass the bar, provided easterly winds do not produce a lower water-stand than usual.

1164. Coming from the eastward, and bound for the Stör, steer a little more northerly than in the direction of Brokdorf Church, until the two easternmost houses on Störort are some distance to the northward of the southernmost house, surrounded by lofty trees. Coming from the westward, and being past Brokdorf Church, keep along shore at 5 to 6 cables' lengths off, until on the mark, when you may steer towards the mouth of the river. You will then soon see the buoys; the black one should be left

half a cable's length to starboard, and then steer E.S.E. ½ E. towards the stick beacons, six or seven in number, which stand along the northern side of the river, in 1 to 2 feet water, and accordingly should not be taken too close. Seventy fathoms inside the buoys the depth is 2 fathoms; but the channel is only 70 fathoms wide and steep-to on both sides. At night steer for the light, which, however, when coming from the eastward, is not visible till near the inlet. Steering in as above directed E.S.E. ½ E., be careful to keep the light nearly a quarter of a point on the starboard bow, in order not to come too near the shallow on the south side.

1165. Stör lighthouse is painted red to serve as a mark by day; but as it stands behind the dike, than which it is but inconsiderably higher, it is not very conspicuous. The light is fixed. *Stör Light.*

1166. Being in the mouth of the Stör and S.S.W. from the north point, keep mid-channel between the lighthouse on Ivenfleth dike and the houses on Störort; and when past the lighthouse, there is anchorage anywhere in the middle of the river as far in as beyond Wewelsfleth, on a soft clayish bottom; large vessels moor in the direction of the river; but for a short stay one anchor is enough with a hawser on shore to keep the anchor clear.

The depth from the mouth of the river to Wewelsfleth is 2 fathoms at ordinary low water; nevertheless, attention should be paid to avoid a small bank with 7 to 8 feet water, lying in mid-channel just inside the bend off the easternmost house on Störort, and to avoid it, keep nearer to the eastern shore, until abreast of a ditch on the west side, with a footpath run across it. *Wewelsfleth.*

1167. From Wewelsfleth up the river to Itzeho the depth mid-channel is 5 to 15 feet at low water, and therefore vessels which are able to pass the bar will find a sufficient depth: in Heiligenstädten Bay there are as much as 6 fathoms water. *Itzeho.*

Though the violence of the drift-ice is considerable, vessels drawing 12 to 13 feet may in this river find a safe refuge during winter, by entering one of the great dykes which discharge themselves into the river at high water; and as the bottom is soft, vessels are not likely to be hurt by lying dry at low water. River vessels may proceed as far as Kellinghusen and through the rivulet Bram Aue, which runs into the Stör, to the shipping place at Wrist in the vicinity of the railroad. *Kellinghusen.*

1168. It is high water at Störort, at full and change at *Tides.*

2h. 49m. A.M., the flood running 5h. 7m. and the ebb 7h. 17m., and its usual vertical rise being 8½ feet. At Itzeho it is high water about 1h. 10m. later than at the mouth of the river, and the usual rise from 7 to 8 feet. The flood stream runs at the rate of 2 to 2·2 knots, being strongest at a quarter tide, and the ebb 1·3 to 1·5 knots, and strongest at half-tide.

Ship Yard. 1169. In Wewelsfleth there is a ship-yard, where vessels may be repaired, if it can be done afloat; and at the town of Itzeho a larger yard, to which vessels at a trifling expense may be towed, by a steamer passing twice a week, from Hamburg to Itzeho.

Fees. 1170. The light money is, according to the size of the vessel, 8 to 32 schillings, Hamburg currency. Vessels larger than 15 com. lasts pay, annually, 12 schillings, and smaller ones 8 schillings, beacon money. Neither at Wewelsfleth nor at Itzeho are there branch pilots.

Gluckstadt Harbour. 1171. The inlet to Gluckstadt Harbour is 2½ miles from the mouth of Stör River. From the white buoy, No. XVII. the channel leading to it has a depth of 16 to 32 feet, and lies to the eastward of the Rhin Plat, or Gluckstadt Bank, lying just off the harbour's mouth. This bank is marked on its east side by two black-and-white striped buoys, in 3 fathoms, viz.: one on the N.E. side of the bank, and the other at its S.E. end, distant about 4½ cables' lengths from the harbour's mouth; and there is also a white buoy on the shore, shallow, placed obliquely to the first-named buoy. The depth in the inlet to the harbour is 5 feet at low, and 15 at high water, and the same depth is in the harbour, although the latter is yet encumbered by mud; but great improvements are making both in the inlet and harbour.

Gluckstadt Light. On the northern pier there is a harbour Fixed light, elevated 24 feet above high water, and exhibiting a reddish light in the direction of the inlet.

1172. The stranger should know, that Gluckstadt Harbour is later frozen up than any other harbour in the Elbe, and frequently is entirely open, when the upper part of the river has been blocked up by ice for months. No shoals with shallow water prevent access to this harbour from sea, and it is to be dredged out and considerably improved. Having a railroad to Kiel it communicates with the Baltic, by Rendsborg railway with the rest of Denmark, and by that of Hamburg with all Germany, as far as Trieste. A royal steam tug attends when the signal

is made to tow vessels in or out, and such as are in distress may here find resources of all kinds.

1173. From the white buoy No. XV. a narrow channel, called Kartoffellock, crosses the south end of the Rhin Flat, which is separated by it from a sand-bank extending to the N.N.W. from Esfleth; and to the eastward an inlet leads to the small tide harbour of Bielenberg. Mid-channel in the Kartoffellock lies a floating beacon, which, by vessels drawing 7 feet, may be passed close by on either side. During winter the buoys are removed and substituted by wooden logs. *Kartoffellock.*

1174. To point out Elmshorn River to Krückaue inlet, stick beacons are placed along the shallow extending to the N.W. from the point of the shore on the south side of the river. In entering, these beacons should be left to starboard about 70 yards, until inside the mouth of the river, when the deepest water is in mid-channel. At ordinary low water the depth at the inlet is only a foot, and inside 2 to 3 feet in a channel 36 feet wide, decreasing in breadth farther up the rivulet, with 1 to 2 feet water until 2 miles from Elmshorn, and from 6 inches to a foot farther in; therefore at low water and with easterly winds it may happen to be entirely dry; but it is now being dredged, and its course made more direct. Krückaue may admit vessels drawing 8 feet, but only those of 5 or 6 feet draught can proceed to Elmshorn; nevertheless the town possesses two whalers and more than 100 small craft called *Ewers;* these vessels are built here, besides some schooners. *Krückaue, or Elmshorn River.*

Beacon money is paid by every vessel in entering. *Port Dues.*

1175. In the mouth of the Elmshorn, high water takes place at 3h. 25m. A.M., and the vertical rise, at ordinary tides, is 8½ feet. At the town of Elmshorn, it is high water 1 hour, and low water 1h. 45m. later than at the entrance, and the rise there is but 4½ feet. *Elmshorn Tides.*

1176. Stick beacons point out the inlet to Pinnau; they are placed along its north side. In its mouth there is only a foot of water, in a channel 8 to 10 feet wide; farther in, in a very narrow channel, there are 1 to 2 feet water, in some places, but in others it is quite dry at low water. The difference between ordinary high and low water is 9½ feet in the mouth of the rivulet; but from there being only 5 to 6 feet at Utersen, only vessels drawing 4 to 5 feet are able to proceed up to the town; and between *Pinnau Rivulet.* *Utersen.*

this and the small town of Pinneberg, a distance of 8 miles, it is only practicable for flat-bottomed vessels and prams drawing 2 feet. The inhabitants of Utersen possess about 100 small craft, which are constantly employed, and two ship-yards, where the like vessels are built. Time of high water at full and change is about 3h. 45m. A.M.

Tides.

Stade Revenue Vessel.

1177. On the west side of the channel, abreast of Schwinge River, is stationed a revenue vessel belonging to the town of Stade; she lies off Stade Sand to the southward of the white buoy No. VII.; from which the channel trends S.S.E., to the northward of the black buoys Nos. 14 and 13, and close along the west side of Juels Sand, which, as well as Breckwolt Sand, is separated from the shore of Holstein by a narrow channel with 4 to 12 feet water; but it becomes dry between Breckwolt and Spitzmer Sands.

Twielenfleth.

1178. At Twielenfleth, a tide guage is erected to indicate the depth of water on Blankenese Sand, in order to make signals to vessels bound up the river, either to anchor or heave to, until the water has risen sufficiently for them to pass. Time of high water at Twielenfleth at full and change is 3h. 57m. A.M., and the range of tide is 8feet.; the flood runs 4h. 57m., and the ebb 7h. 27m.

Tides.

1179. From Twielenfleth the course of the Elbe is pretty straight between the black buoys 12, 11, 10, and 10A, and the white buoys VI., V., and IV., past the light-vessel at Lühe, and as far as Schulau light-vessel. From a late survey, a deeper channel than the one formerly used, has been ascertained to exist along Hanskalb Sand; this new channel is now buoyed, and on its north side, N.W. by W. and S.E. by E., distant half a mile from each other, are the light-vessels at Lühe and Schulau. The Lühe, the outer light-vessel, has one mast and lies in 10 feet at low water, with Mielstack bearing W.S.W. ½ W., and the house on Fahrmann Sand N.E. by N.; by day she carries a red and white flag, and at night shows one light. Schulau light-vessel also has one mast, and lies in 2½ fathoms, with Schulau ferry-house E. ½ N. and Fahrmann Sand house N.N.W., and exhibits a red light elevated 22 feet above the water; she carries no flag, but in foggy weather a bell is tolled: this vessel only leaves her station when compelled by the ice. It is intended to place small buoys on a projecting curve of the sand-reef, between the light-vessels, and on such parts in the old channel

Lühe and Schulau Light-vessels.

that were formerly marked by buoys; there is also to be a black buoy on the south side of the new channel where it unites with the old one, off Schulau ship-yard.

1180. At Schulau, the low marshy country of the shore of Holstein terminates, and the dikes and the shore rise considerably as far as Blankenese; its most elevated part, Baursberg, being 304 feet above the mean level of the Elbe. The deepest channel lies close along this high shore, and until past Blankenese it is only marked by black buoys along its south side. The space between the black buoys, Nos. 4 and 1, is called Blankenese Sand, on the shallowest part of which the depth is 7½ feet at ordinary low water. Between the buoys Nos. 4 and 3, in a channel leading obliquely from the shore across the flat, there are but 14¾ feet at ordinary high water, and thus limits the draught of vessels adapted to the trade to Hamburg or Altona. It ought to be observed, that the channel up this river has been subject to great changes; 40 years ago it ran along the Hannoverian shore, to the southward of the Böhaken, but during the last 32 years it has preserved its present direction and depth, and in consequence of so many large steamers frequently passing and repassing, forcing their way with full power over the sands, and sometimes even touching the ground, it is probable the depth will be still increased. Neither labour nor expense has been spared to remedy this hindrance, so annoying to the Hamburg and Altona trade, and in the year 1846 a channel a third of a mile long, and with a depth of 10 feet, was dredged through the shallowest part of the flat. But from the nature of the soil in the bed of the river, being loose sand, no reliance can be placed on its stability; and a severe winter with ice may totally destroy all such artificial channels. The upper part of the Elbe from Schulau it is not possible to make available to large vessels; yet, while the brisk trade now existing continues, and while due attention is paid to remove all impediments, the depths on the shallows are not likely to decrease.

Blankenese Sand.

1181. Above Blankenese lies the last white buoy No. 1, placed on a flat off Teufelsbrücke, but farther up the river, off Altona and Hamburg, there are 6 floating beacons along the south side of the channel, instead of the black buoys, which it would not be right to place in this narrow part of the river; so narrow, indeed, that no steamer is allowed to go at full speed farther in

Teufelsbrücke Buoy No. 1.

Regulations for Steam Vessels.

than abreast of Ottensen Church; and from Altona Harbour, or from the Danish guardship to Hamburg, to use only half power.

Lühe and Este Rivers. 1182. Above Twilenfleth, the rivers Lühe and Este run through the shore of Hannover into the Elbe. Up these rivers, as well as to Borstel, a village standing near a sluice on the dike, the traffic is carried on by small craft called *Ewerts;* and similar vessels ply also to Finkenwarder, an island partly belonging to Hamburg and partly to Hannover.

Wedel. 1183. On the opposite shore of Holstein, small craft go up to the small town of Wedel, by a rivulet, which is dry at low water, but has 6 to 7 feet at high water. From Schulau a ferry crosses to Borstel, where, as well as at Wittenberg and at Bur-

Ship-yards. mester, there are ship-yards at which vessels of moderate size are built.

Blankenese Village. 1184. Blankenese, which has no church, and is inhabited chiefly by fishermen, is a remarkably increasing and flourishing village; it has at present more than 2000 inhabitants, possessing 300 small craft, employed in trade, fishing, and pilot duties, even as far as the British Channel, and is likely soon to be a place of more importance. From thence a ferry crosses to Cranz, at the mouth of the river Este, and when the river is frozen up the mail to Cuxhaven is conveyed across the ice.

Oevelgönne. 1185. At Teufelsbrücke, where the Flottbeck stream runs into the Elbe, as well as at Oevelgönne, ship-building is carried on and in the latter place excellent boats are built. The contiguous village, Neumühlen, is inhabited by clever seamen, principall occupied as pilots, not only in the river, but beating about its mouth in cutters which go to the British Channel, to take charge of vessels bound for the Elbe.

Altona Harbour. 1186. Altona Harbour is formed by strong piles outside, and heavy mooring posts driven sufficiently into the ground to sustain the effects of the ice. Between the piles outside, cross pieces, called *Slengels*, are laid, so that vessels of too great draught to lie afloat at low water in the harbour may unload or load.

The harbour has been prolonged to the west end of the town; but its inner, or eastern part, needs much dredging. The Baltic

Railway Pier. railroad communicates with the west end of the harbour, and has a quay built of stone for the convenience of shipping.

1187. The Rummelhafen, or Hamburg outer harbour, is, according to treaty, common to Altona, the trade of which are entitled to use it as much as if the harbour belonged to that town.

1188. Just abreast of Altona harbour, the large and wide channel of Kühlbrand, branches off to the southward to Hamburg. By this branch of the river, which connects the Norder with the Süder Elbe, the direction of the tide is not only altered, but its velocity is considerably increased. Farther up the Norder Elbe the tide is much weaker, and consequently the channel is more apt to be impeded by the deposit of sand. The navigable part of the river does not extend beyond the eastward of Hamburg harbour, and it is only by dint of much labour prevented from being choked with sand. Recently by the erection of a dam, the tides in the smaller branches have been compelled to find their way through the main channel, which there is the Norder Elbe. *Kühlbrand Channel.* *Hamburg Harbour.*

The inner harbour is formed at the junction of the Alster river with the Elbe. But as the inner end of the harbour is separated from the Alster by a sluice, while none exists at the side facing the Elbe, the depth in that harbour is only 2 feet at low water; but it is intended to improve it by dredging. In the outer harbour, the deepest part of the Rummelhafen is 12, 13, and 14 feet at low water, and in the harbour lately constructed for steamers, a depth of 14 feet at ordinary low water is dredged out along the stone quays.

1189. It is superfluous to observe that at Altona and Hamburg vessels easily obtain resources of all kinds; but as no docks exist there, such as require considerable repair must be hauled up on the slips. *Supplies.*

At a moderate price, steam-tugs take vessels across the sands; and, by a telegraphic communication between Cuxhaven and Hamburg, notice is given of the arrival and departure of vessels. *Steam Tugs.*

The rise and fall of the tide is perceptible as far as Zollenspieker, distant 16 miles above Hamburg. *Tides.*

1190. The craft employed on the Upper Elbe consists chiefly of large, flat-bottomed vessels, some of which are steamers; but during dry seasons such vessels meet considerable impediments in the low water-stand of the river; and even at Lauenburg, the depth is only sufficient for vessels drawing 3 feet. *Upper Elbe.* *Lauenburg.*

1191. A canal by which the Elbe communicates with the *Stecknitz Canal.*

Steckenitz river, and by it with the river Trave and the Baltic, begins at Lauenburg, where there is a custom-house at which vessels navigating the Elbe pay certain duties.

Tide Table.

TIDE TABLE for the WEST COAST of DENMARK.

PLACES.	High Water Full and Change.	Mean Range between Springs and Neaps.	PLACES.	High Water Full and Change.	Mean Range between Springs and Neaps.
	h. m.	Feet.		h. m.	Feet.
Skagen	5 56	1·0	Friedrichstadt	2 37	9·0
Hirtshals	4 28	1·0	Tönning	2 1	9·5
Agger Minde	4 9	1·1	Wollerwick	1 14	9·8
Thorsminde	3 34	1·3	Blauort Sand	0 38	10·0
Nyminde Gab	2 41	2·1	Norder Piep	0 50	10·7
Blaavands Point	1 44	5·1	Büsum Harbour	1 21	10·2
Hierting	2 45	5·1	Meldorf Harbour	1 32	9·5
Nordby	3 2	5·0	Flackström, S. end	1 1	10·2
Sönderho	2 22	4·8	Helgoland	11 45	8·5
List	2 21	5·6	Cuxhaven	1 8	9·9
Höyer Canal	3 19	5·9	Brünsbuttel	1 58	9·4
Southwest Horn	2 43	7·8	Stör River (Störort	2 49	8·7
Dagebüll	2 19	8·9	Stör River Itzeho	4 0	7·7
Wyk	2 21	8·3		3 9	9·8
Amrum	1 19	8·2	Glückstadt	3 25	8·7
See Sand	0 50	8·2	Krück Aue	3 47	9·5
Bongsiel	2 13	10·3	Pin Aue	3 57	8·2
Bordelumsiel	2 42	..	Twielenfleth	4 35	7·7
Pelworm	1 57	10·4	Schulau	4 44	7·4
Süderoog	1 10	9·6	Blankenese	5 4	7·2
Husum Harbour	2 36	9·6	Teufelsbrücke	5 19	6·9
Ording	0 45	9·3	Altona	5 29	6·3
Rendsborg	7 42	3·9	Hamburg		

CHAPTER XVI.

THE COAST FROM THE TEXEL TO THE WESER.*

1192. ALONG the coast of Holland and East Vriesland, from the Texel to the Weser, there are numerous islands and loose sandy shoals, between and across which the tide has formed different inlets. *General Remarks.*

1193. The frequent changes of position and extent of these shoals, and the difficulty and delay in obtaining accurate information of them in this country, as well as of the consequent changes in the buoys and beacons, would render any minute directions for them not only useless to the navigator, but in fact, a snare which would lead him into difficulty if not into danger. We shall therefore, generally, confine those directions to a safe navigable distance from the shore, when pilots may always be procured, or from whence immediate refuge may be obtained in any of the principal inlets, by remembering that on entering the Texel and Vlie Strooms the black buoys, with few exceptions, are to be left on the port side, and the white on the starboard side; but that in all the other entrances, a reverse arrangement will be found.

1194. Off the mouth or estuary of the Zuider Zee lie the islands of Texel, Vlieland, Terschelling, and Ameland; and between the shoals surrounding them there are several channels, of which the three principal are, the Texel Stroom, the Vlie Stroom, and Ameland Gat. *Zuider Zee.*

1195. The Texel Stroom, or western inlet to the Zuider Zee, lies between the mainland and the south end of Texel Island. *Texel Stroom.*

When to the westward of Kykduin, in 15 to 16 fathoms, and about 8 or 10 miles outside the shoals, you are without the influence of the tide in the inlets, and the flood, which during the first 5 hours, sets N.E. or E.N.E., then veers to E. and S.E. The ebb during the first hour runs S. by W., then S.W., for 4 hours, then veers to W.N.W. and to N. Along the shore and the *Tides.*

* According to the Surveys of A. Van Rhyn, Keuchenius, and Swart.

shallows, the last part of the ebb and the first of the flood both set N.W., whereas the last part of the flood and the beginning of the ebb runs S.E.

At the Schulpe Gat it is high water at the outer buoy at 6h. 30m. and in Texel road at 7h. 27m., the ebb commencing one hour later in the road, than outside the shoals. Spring tides rise 4 or 4½ feet, and during S.W. and N.W. gales even 5 feet, but neap tides not more than 3½. The usual rise of the flood, during the two first hours, is 2½ feet. In mid-channel the flood continues its direction some time after high water, and even when the water has begun to fall. During westerly gales, the flood continues longer, and with boisterous weather you may calculate on having a flood tide 8, and an ebb tide only 4 hours. With S.W. gales there is no ebb at all.

Pilots. 1196. Pilots will generally be seen beating about some miles off the Texel ready to attend. The smacks carry a blue flag, and the pilots some authorized signal.

Conspicuous objects. 1197. Kykduin fort and lighthouse stand on a high, whitish sand-down on the south side of the Texel Stroom, in 52° 57′ 5″ N., and 4° 43′ 37″, east of Greenwich: the light is stationary, elevated 154 feet above high water, and visible 14 miles off, Schoutenkaap is a beacon erected on the high shore to the eastward of Kykduin; and North Kleinekaap or Ruigebeen, a smaller beacon on the beach. Vuurboet, the old light, stands close to the northward of Kykduin.

Kykduin Light.

North Kleine-kaap.

1198. Four miles to the southward of Kykduin there are two beacons, the Groote and South Kleinekaaps; the former carries a round frame and stands on the sand-down, the other a square frame, on the beach; both beacons in one, bearing S.E. ¼ E., serve as a mark for the outer buoy at the Schulpe Gat, and leads to the southward of all the shoals. The whole of this shore is low, and has, besides the above-mentioned conspicuous objects, Calandsoog tower; farther to the southward the small village Petten, inhabited by fishermen; and 14 miles from Kykduin, the conspicuous Kamperduin (Camperdown).

Groote and South Kleine-kaaps.

Petten Shoal. 1199. The only shallow place on this part of the coast is a small patch off Petten, called Pettenpolder, with 11 to 16 feet water, and 9 fathoms round it, lying 2 to 3 cables' lengths from the beach, Petten bearing from S.E. to S.E. by E.

Haak Grounds. 1200. Off the mouth of the Texel Stroom are the Haak Grounds, extending along shore N. and S. to a distance of 6

miles off shore; their W. and N.W. edges are steep-to 8 and 9 fathoms, but their south side may be approached by the lead.

Making the Texel.

1201. Vessels coming from sea and bound to the Texel, should make the land between Kamperduin and Calandsoog, and on coming from the northward be careful to avoid the Haaks, especially as their west side cannot be approached by the lead. Calandsoog, not bearing more southerly than S.S.E., or visible to the southward of the sand-down adjacent to it, leads to the westward of these shoals, and you are to the southward of them when Kykduin bears E.

1202. Several channels lead across these shoals to the Texel Stroom, of which the principal, Schulpe Gat and West Gat, are provided with buoys. Duinkers Gat, Molen Gat, and North Gat are only practicable to small craft, and require a perfect knowledge of the locality.

Schulpe Gat.

1203. Schulpe Gat, between the South Haaks and the main, has a depth of 20 to 23 feet at low water on a bar at the inner end of the channel, and is marked by 8 black and 4 white buoys; the black being placed along the west side of the channel.

Tides.

1204. The direction of the flood-stream at the outer buoy is north, to the westward of which it runs the strongest. As the tide gradually rises, it inclines more easterly, and at half flood it runs in the direction of the channel. The first of the ebb sets S.S.W., and changes more westerly in the direction of the black buoy at half ebb. In this channel the tide begins to flow 1¼ hours earlier than in the West Gat.

Entering Marks.

1205. To enter by the Schulpe Gat, should you be compelled to attempt it without a pilot, keep the Groote and South Kleine-kaaps in one until the Tower de Westen appears between the Heuvel and Jonge Petersduin, bearing about N.E. ¼ N., which is the leading mark through the Gat as far as the sixth black buoy, when the course must be changed to N.E. by E. ½ E. between the two remaining black buoys on the port hand, and the three white buoys on the starboard, over the bar into the Helsdeur Channel, having entered which steer about east or E. by S. for the road. The shallows on both sides of the Helsdeur Channel are steep-to, but its north side should not be approached within 5½ fathoms.

Texel Road.

1206. The best anchorage in Texel road is with Kykduin between the saw-mill and the palace, having Burg church in

one with the east side of the Horntje, the southernmost sand-down, on Texel; or the Tower de Westen in one with the Horntje, anchoring in 11 to 8 fathoms water, according as you may be nearer to the first or to the last of these marks.

West Gat. 1207. The West Gat, between Middelrug and Wittetonsrug on the western parts of the South Haak, is, with north-westerly and northerly winds, only practicable during moderate weather, for, though the channel inside the bar is large, and has deep water, you are annoyed by the tide, which sweeps athwart the channel, and during boisterous weather occasions a rough sea. The channel is marked by 5 black buoys along the Middelrug, and 4 white buoys along the Wittetonsrug. On the bar in the mouth of the channel, between the outermost black and white buoys there are 14 to 16 feet at an ordinary low water, but deepest at the white buoy; the bar is only half a mile across, and at its inner edge the depth increases to 23 feet. From the West Gat you pass into the Breewyd or channel between the Laan, on the south side of which are two black buoys, and the Bollen marked by a red and white buoy, and from thence into the Helsdeur channel (Art. 1205.)

Tides. The flowing stream sets more northerly than N.E. athwart this Gat, until half-flood, and then it follows the direction of the channel: the first of the ebb sets S.S.W., and then W.S.W. through the Gat. From Cape Hoofd, the ebb runs past Schulpe Gat, from which the first of the flood sweeps across the channel, where the ebb-tide continues longer than in the Schulpe Gat.

Entering Marks. 1208. Coming from the northward or westward with the intention to enter by the West Gat, and unable to obtain a pilot, keep the Groote and South Kleinekaaps in one until Hoorn church shows between the Heuvel and Jonge Petersduin; then steer E.N.E., between the outer black and white buoys, then E. by N.; and when Schoutenkaap shows between the lighthouse and Vuurboet, steer E. towards the road. During a flood-tide you should give a berth to the black buoys, and during an ebb-tide the same to the white, and under all circumstances bear in mind what has been mentioned above respecting the tide.

North Gat. 1209. The North Gat, between the North Haaks and Texel Island, has on its bar scarcely 12 feet water. Several shelves of sand, which are formed in the mouth of the Gat, nearly obstruct the passage, which is not provided with buoys.

1210. The Nieuwe Diep lights on the wierhoofd or jetty at Willemsoord, stand 29 and 35 feet above high water, and are visible 8 miles distant. These lights are Fixed, the outer one at the extremity of the jetty, showing a bright White light, and the inner one, which is the highest, and 153 feet S.W. of the former, a Red light. When the Red light is seen well to the southward of the White light, the Nieuwe Diep is open to view, and by steering S.W. rather westerly, you pass clear of the moorings placed there. *Nieuwe Diep Lights.*

1211. The guard-ship stationed in the Nieuwe Diep or in Texel Roads is 0 h. 19 m. 7 s. east of Greenwich, and the instant of mean noon is daily announced by the dropping of a ball. This ball is hoisted half-mast 5 m. before mean noon, and at 2 m. close up. Any one desiring to compare their chronometer is admitted on board. *Time Ball.*

In the Nieuwe Diep there is likewise stationed a steamer; and when a signal is made by firing two guns with an interval of half a minute, or by showing two colours on one of the mast-heads, it is answered from Kykduin lighthouse, and the steam-tug is despatched as soon as possible. *Steam-tug.*

1212. Between the islands of Vlieland and Terschelling is the Vlie Stroom, the northern inlet to the Zuider Zee, and is likewise marked by buoys. *Vlie Stroom.*

Both of these islands are low with sand-downs, visible 12 miles off. On the highest sand-down, in 53° 17′ 48″ N. and 5° 3′ 46″ E. on the east end of Vlieland, stands a stone edifice, in which is exhibited a Fixed light, 151 feet above the level of high water; other conspicuous objects are the Veldkaap beacon, to the eastward of the lighthouse; somewhat nearer, a mill, visible in a hollow between the sand-downs; and between the mill and the lighthouse, Duinkaap beacon; to the north-eastward of the lighthouse are the Kleinekaap and Strandkaap beacons, the first-named being the easternmost. On the west end of Terschelling stands Brandaris tower, high, round, and flat-roofed, in 53° 21′ 40″ N., and 5° 13′ 8″ E., in which is shown a Revolving light, visible 15 to 16 seconds every minute, and darting a bright light during 6 seconds: it is elevated 177 feet above high water, and visible 20 miles off. *Conspicuous objects.* *Vlieland Light.* *Terschelling Revolving Light.*

It is said that in clear weather Brandaris tower may be discerned when off the coast, in 15 fathoms water. The village of West

Terschelling soon after becomes visible, likewise a mill to the northward of the tower, and to the westward of it two beacons; farther inland on the island, Misland church, and still more to the eastward Hoorn church, and finally on the North Vaarder shoal stand two beacons.

Shoals off the Vlie Stroom.

1213. Off the entrance between Vlieland and Terschelling which is 5½ miles in breadth, the shoals extend to a distance of 7 miles to seaward, and across them different channels afford access to the Vlie Stroom, of which the principal are Stortemelk, Hollepoort, and the New or North-east Gat, all marked by buoys (*see* Art. 1193); yet, from the frequent changes in those inlets, no vessel should attempt to enter by either of them without a pilot.

Soundings on approaching from the Northward.

1214. Coming from the northward, the bank extending to a distance of 20 to 24 miles from those islands and the Texel afford a safe guidance. To the northward of the bank there are 18 to 23 fathoms water; on the bank is fine sand spotted with black, and abreast of Vlieland fine reddish sand with broken shells; whereas abreast of Texel Island it is fine white sand, indicating that you are yet to the westward of the entrance to the Vlie Stroom, which it is important to make sure of, because, in coming from the Hoofd, you have this inlet under your lee, on account of westerly winds being most prevalent during the greatest part of the year, and the tide sweeps to the eastward in such a manner, that during a continuance of boisterous weather two successive flood streams continue, while the ebb only runs once. As soon as you are on the bank, in the latitude of Vlieland and Terschelling, the depth immediately decreases to 11 and 12 fathoms. In standing towards the coast you are in soundings at a distance from it of about 8 miles in a depth of 13 to 14 fathoms, then 11 to 12 fathoms, which again increases to 14 and 15 fathoms. Both of these channels, together with the ridge between them, have an extent of 1 mile north and south; the deepest channel is distant 8 miles from the coast, and farther in the water shoalens to 10 fathoms, close outside the outermost buoy. The northern outer shoals are steep-to; but to the westward and eastward of these you may approach Vlieland and Terschelling by the lead, as the depth on the shallow from the shore gradually decreases.

Pilots.

1215. On Vlieland as also on Terschelling there are pilots, beating about outside, or meeting vessels at the entrance, if

prevented by stress of weather from getting out; only Terschelling pilots take vessels in, whereas those from Vlie take vessels out to sea, except those vessels leaving Terschelling road. Vessels entering and bound through the Vlie Stroom, should anchor in Vlie road to be cleared at the custom-house.

1216. West Terschelling Harbour is of great consequence to the shipping in the Zuider Zee, and is frequently resorted to as a winter harbour for such vessels as are prevented by ice in proceeding on their voyage. Vessels in distress may here be provided with all necessaries. The depth in the harbour is 14 to 16 feet at high water. *West Terschelling Harbour.*

1217. Off the mouth of the Vlie Stroom in the vicinity of Vlieland, the flood sets E.N.E., and the ebb W.S.W., and E. and W. at Terschelling, and veers in the direction of the sun, or from left to right. The time of high water at full and change is, at the outer shallows, 7h. 10m.; in West Terschelling harbour 8h. 40m.; in Vlie road 8h. 0m., and in Harlingen harbour 9h. 0m. At West Terschelling, the vertical rise at springs is 6½ feet, and at neaps 5 feet; at Harlingen it is 1 foot less: still the force, direction, and duration of the winds occasion considerable irregularities to this general rule. *Tides.*

1218. Between the west end of the island of Ameland and the north-eastern shores of Terschelling, the Bösch, is the Ameland Gat. *Ameland Gat.*

Like the before-mentioned inlets, this Gat is also surrounded by shoals, extending to the distance of 3 miles off, and forming three different channels, viz.; North-west Gat, North-east Gat, and Akkepolle Gat, of which only the two first named are provided with buoys.

The eastern part of Terschelling, the Bösch, is a sandy flat, extending 1¼ miles, and uncovered, except at extraordinary high spring-tides; on its east end are two beacons, which serve as a leading mark for the North-east Gat. *Terschelling Beacons.*

Off this gat, beyond the effects of the river-tide, the flood sets E.N.E., and the ebb W.N.W. in the direction of the entrance. The gradual veering of the tide, which occurs farther to the westward, does not exist here: with few exceptions, the stream follows the direction of the channel. At full and change it is high water off the entrance, at the outer banks 9h.; in Hollum Roads 11h. 30m.; in Ballum Bay and at Abt 10h. The ordinary rise *Tides.*

is 6½ feet, but at springs 7 feet; on the Wats, farther to the eastward, the tide rises one foot higher, and falls one foot lower.

Vriesche Gat. 1219. Between the west end of the island of Schiermonnikoog and Engelschman Plaat is the Vriesche Gat, affording access to Vriesland and Gröningen. It is buoyed; and on entering it, the black buoys should be left to starboard, and the white to port.

Conspicuous objects. The westernmost and highest sand-downs on Schiermonnikoog become visible pretty far off; behind them is the village with a tower, and to the westward of the latter a mill. Two beacons are placed on this island; the largest one, Grootekaap, bears N.W. ½ W. from the tower; and S.W. from the smallest beacon, the Kleinekaap, stand 2 beacons on the eastern part of Engelschman Plaat, the northernmost of which is the smallest.

Shoals off the Vriesche Gat. 1220. Off the mouth of this Gat, shoals extend 4 miles to seaward, consisting of hard sand, which are subject to frequent changes, particularly the western parts. Two channels across these shoals give access to the interior water, viz., the North-east Gat and the North-west Gat, formerly called the Middle Gat. Engelschman Plaat, between the Vriesche Gat and the east end of Ameland, is 3½ miles wide and dry at low water. Along the north side of Engelschman Plaat are the Wierum shoals, which, as also the shallow from the shore of Ameland, may be approached by the lead.

Tides. Off the coast, in 10 fathoms water, the stream runs E. by S. and W by N.; at the outer buoy it sets E.S.E. and W.N.W., and the time of high water at full and change is at 9h. 0m., on the Gröning Wad 9h. 45m., and at Zoutkamp 10h. 0m. In the channels, the ordinary rise is 7 feet, at spring tides 8½ feet, on the Gröning Wad 1¾ feet more, and it is the greatest during the third and fourth hour of the flood or the ebb. Here, as in general along the coast, the direction and force of the winds greatly influence the water-stand.

Lauwer Channel. 1221. The island of Schiermonnikoog is 7 miles long. To the eastward of the island, and close to it, is Simons Sand, and a mile farther to the eastward, Bosch Plaat, separated from the former by the Lauwer Channel; both of these sands are dry at low water. Along the north side of Schiermonnikoog, the shallow extends 2 miles from the beach, and shoalens gradually from 4 fathoms, but outside Simons Sand and Bosch Plaat it extends 4 miles off, and forms an inconsiderable flat.

1222. Revenue vessels are stationed at Engelschmans Plaat; but during the winter season these vessels are commonly stationed off Oostmahorn or Zoutkamp. *Revenue Vessels.*

The Ems.

1223. The mouth of the river Ems is divided into two branches by Borkum Island, having the Randzel Bank to the south and Borkum Reef on the north. These branches, termed the Wester and Oster Ems, unite to the southward of the Randzel, and is then called the Ems; this river is practicable to large vessels, as far as the roadstead off the point called the Knock, distant 32 miles inside the outer shoals. The Wester Ems forms the boundary between Germany and the Netherlands. *Ems River.*

Both the Wester and Oster Ems are buoyed, and the general rule in entering this river is to keep the black buoys to starboard, and the white to port (*see* Art. 1193).

Branch pilots are not stationed here, but the fishermen from Borkum are expert, and take vessels up the river: however, during the winter season, you cannot safely rely upon getting such a one on board, as at that season their boats are hauled on shore. *Pilots.*

1224. The island of Borkum belongs to the kingdom of Hannover. On its west side stands a square tower in 53° 35′ N. and 6° 40′ E., built of red bricks, from which a Fixed light is shown, at an elevation of 142 feet above the level of the sea. Near the lighthouse two beacons are placed, the smallest, called Kleinekaap, lies N.W. by W., and the largest one, Grootekaap, N. ¾ W. from the lighthouse. There are also two beacons on the eastern part of the island, standing N. by E. and S. by W. from each other, the smaller beacon being the northernmost. On Borkum Reef at 7½ miles N.N.W. from the lighthouse the depth is only 3 fathoms: off its west end there are 9 to 7 fathoms water, which abruptly shoalens to 3 and 2 fathoms. *Borkum Light and Beacons.* *Borkum Reef.*

On the small island of Rottum stand two beacons, N. ¼. W. and S. ¼ E. from each other, the northernmost being the smallest is called Gröningerkaap, and the other one Embderkaap; to the eastward of them stands the bailiff's house. *Rottum Island and Beacons.*

1225. The Wester Ems winds between the remains of the island of Rottum on the west, and the island of Borkum on the east side, and its mouth lies between Geldzak Plaat on the north side, and the north end of Huibert Plaat on the south side. This *Wester Ems.*

inlet is narrow, and the depth on the bar irregular: westerly and north-westerly winds occasion a hollow sea and a furious surf; on account of which great caution is necessary in making the river, particularly during boisterous weather.

1226. The Wester Ems admits large vessels, and through Riff Gat, along the S.W. side of Borkum Reef, even the very largest may pass; whereas the Oster Ems, on the inner bar, has only during high water a sufficient depth for vessels not drawing more than 17 feet.

Directions for making the Ems.

1227. Having passed the Texel, with the wind west or north-westerly, you should not approach the shore within the depth of 16 or 17 fathoms, before being past Terschelling; then shape an easterly course towards Borkum Reef, in 15 to 17 fathoms, according as the wind is southerly or northerly: the lead should be frequently used, because the setting of the tide towards the islands may sometimes be pretty strong. On approaching the outer shoals the depth gradually decreases to 12 and 11 fathoms, and then, provided the weather be clear, you will be able to see the light-house, distant about 12 miles; and you are then only distant 3 to 4 miles from the outer shoals and their buoys, off which are 8 fathoms, at low water. Along the north side of Borkum Reef there are 7 and 8 fathoms, and the bottom is of a yellowish hue, but nearer to the reef, hard sand.

When the wind is free, you should keep well to the north-west of Borkum, on account of the tide commonly setting to the eastward, and in this direction you may stand for the shore, in a convenient depth, without any fear of the shoals.

Soundings on Borkum Reef.

When coming from the northward, beware of Borkum Reef, attend to its peculiar soundings, which consist of coarse sand, with red and yellow pebbles and brown shells, and by its gradually decreasing depth, affords remarkably good information. In clear weather the sand-downs of Borkum are just in sight.

Tides.

Off the entrances of the rivers, outside the influence of the river tide, the ebb runs W. and the flood E., but during the last hour the ebb inclines rather northerly; the stream changes just at the hours of high and low water. At the Outer buoy it is high water at 10h., in Borkum Road 10h. 30m., and in Delftzyl Harbour 11h. 15m., where the ordinary rise is 8¼ feet, but at spring tides 9¾ feet: southerly winds produce the lowest water-stand. During the first three hours of the flood the water rises

6 feet, during the last four hours of the ebb it falls 7 feet, and in the mean time the stream runs the strongest.

1228. Borkum Road is a hollow, in which the greatest depth is 18 fathoms: the best anchorage is near the beach, with the lighthouse bearing N. by E., where you may ride sheltered against north-west and easterly winds. The distance from the outer buoy to the roadstead is 8 miles. Borkum and Knock Roads were during the war the common resort for the English vessels-of-war. *Borkum Road.*

1229. The Oster Ems runs between the island of Borkum on the western, and the shallows from the island of Juist on the eastern side: its entrance lies between Brouwers Plaat on the south, and Juist Reef on the north side; it is easier of access than the Wester Ems, and accordingly it is more frequented, notwithstanding it has a less depth on the bar in the Wester Balg. *Oster Ems.*

The outer bar projects from the southern spit of Juis Reef, and is contiguous to the south-eastern part of Brouwers Plaat; the least depth on this bar is 19 feet; the inner bar is in the southernmost part of the Wester Balg and has a depth of 10 feet only. *Outer and Inner Bars.*

1230. Juist Reef lies at the mouth of the river, and extends N. and S. 3½ miles: its west and north sides, particularly the latter, has shallows, and may be approached by the lead, whereas the whole of the east side of the reef is steep-to. *Juist Reef.*

1231. Brouwers Plaat is on the eastern part of Borkum Reef, and to the northward of the eastern part of the island: it is formed by two projecting spits, leaving between them an indenture, with only a few feet water, but is nowhere dry. Schaape Sand and Kachelot Plaat are the western shoals, extending from the island of Juist; the bottom on them is hard sand, and on the last-named there is only a depth of a few feet. *Brouwers Plaat.* *Schaape Sand*

1232. The range of islands between the Ems and the Jahde is distant 3 to 5 miles from the shore, from which it is separated by wads, or shallows, dry and passable at low water. The distance between these islands and the main is constantly increasing from parts of the islands being carried away; and while their circumference is thus diminishing they are, at the same time, shifting to a more easterly position. The tidal stream runs east and west along the islands, and it is not until half tide that its effect *Islands and Inlets between the Ems and the Jahde.* *Tides.*

becomes perceptible in the intervening inlets. The vertical rise is commonly 8 feet along this range of islands. At Norderney the time of high water at full and change is 10 h. 30 m.

The balges and passages across the wads are partly indicated by beacons on their north and west sides; and along these you should pass inside the islands, which, however, is practicable only for vessels not drawing above 5 feet, and only during high water. During the bathing season, regular steamers ply between Norderney, Bremen, and Hamburg.

Juist. 1233. Juist, the first island to the eastward of Borkum, consists of a western and an eastern part, and on the centre of the latter is a village.

Norderney. 1234. The island of Norderney, renowned as a bathing-place, is separated from the last-mentioned island by the Buyser Deep, and is conspicuous from three lofty, white sand-downs on its eastern part. The village, having a church without a turret or steeple, stands on the west end, and in the village there are two remarkable buildings, each of which has a small steeple: the one called the Palace is a square building with two stories, the other, the Conversation-house, is built in an oblong square, and only one story high.

Baltrum. 1235. The island of Baltrum lies to the eastward of Norderney, and is separated from it by a passage called Wichter Dybet. Off the mouth of this inlet is the North Plaat, dry at low water, and forming two narrow entrances, one to the east and one to the westward of the shoal: the most spacious of these entrances trends along the northern and western beaches of Baltrum, with 8 feet water, to the road, where several balges disembogue.

Langeroog. Langeroog Island, separated from Baltrum by the inlet Ackumer Ee, consists of a western and an eastern part, and has a village on the first-mentioned. Off the mouth of this inlet there are shoals, extending to a distance of 2 miles to seaward, and having only a few feet of water on them, but steep-to from a depth of 8 to 10 fathoms.

Spikeroog. 1236. Otzumer Balg, or inlet, separates Langeroog from Spikeroog, on the northern part of which is a remarkable white sand-down, visible 12 miles off, and in the centre of the island a village, and immediately to the westward of the latter the remains of a battery, and on the west end two beacons, lying nearly S.S.E. and N.N.W. from each other. Off the mouth of this

Balg lie several shoals, of which the easternmost and adjacent to the island becomes dry at low water.

1237. The Harle passage separates Spikeroog from Wangeroog, the easternmost of these islands, the east end of which borders the Jahde River. *Wangeroog.*

1238. On the N.W. part of Wangeroog, in 50° 47′ 27″ N., and 7° 51′ 6″ E., stands a lighthouse, 64 feet above high water, in which is exhibited a Revolving light, its interval of revolution being one minute. The village church, which is W. ½ S. from the lighthouse, has a high, pointed steeple: on the south-eastern beach of the island are erected two beacons. *Wangeroog Revolving Light.*

Pilots are not to be had here; but the fishermen of the island are expert, and take vessels in, according to an agreement with the master, when sent for. This island belongs to the Grand Duchy of Oldenburg. *Pilots.*

The Weser.

1239. Off the mouth of the Weser are several shoals, forming three inlets, of which the westernmost leads to the Jahde River.

In entering the Weser, the black buoys should be left to starboard, and the white buoys and the outer light-vessel No. 1 to port. The black buoys are marked with letters painted in white, and the white buoys, some few excepted, are marked with numbers in black, the buoys in the Wurster passage are besides marked with a W. (*See* Art. 1193.) *Buoys.*

The buoys in the Jahde are taken in at the commencement of November, except the outer buoy. The black buoy A, and the buoys belonging to this range, the one painted with white and black stripes included, are then substituted by wooden logs.

1240. At present three pilot-cutters are attached to this river, one Hannoverian, one Bremish, and one Oldenburgish, the two former cruize in partnership; and, accordingly, when the one is on her station to the northward of Wangeroog and the mouth of the Weser, the other goes to the westward, to Borkum and to the Texel: the Oldenburgish cutter most commonly remains in the vicinity of the mouth of the Jahde. All pilots belonging to the cutters or yachts are called sea-pilots, and are entitled to pilotage wherever they are able to take vessels: this rule also applies to the pilots from Blankenese. The cutters are bound to remain at sea in all weather. *Pilots.*

Conspicuous objects.

1241. In making the Weser and the Jahde, the only landmark is Wangeroog tower; and it is not before being past the outer light-vessel in the Weser, that the great Bremer beacon, standing on the eastern edge of Hohe Weg Sand, and the inner light-vessel, heave in sight.

Norder Flat.

The outer and northernmost shoal, the Norder Flat, extends 12 miles N.W. and S.E., and according to the French survey, has only 12 feet water on its shallowest part.

Outer Buoy in the Weser.

1242. The outer black buoy of the Weser, the Schlüsseltonne (Key buoy), carries two keys painted white on a gilt pole, is placed in 10½ fathoms, with Wangeroog lighthouse S.W., 5 miles, and Minsen church S. ¾ W.; the black and white striped outer buoy, off the Jahde, is distant 2 miles S.S.W. from this buoy.

Outer Light-vessel No. 1.

1243. The outer Light-vessel No. 1 lies mid-channel in 8 fathoms, with Wangeroog lighthouse W. ¾ N., Minsen church S.W. by W. ⅝ W., and Bremer beacon S. by E. ⅛ E., and 8 miles from the Schlüssel buoy; the vessel is painted red, and carries a ball at her mast-head, by which she may be distinguished from the Elbe light-vessel. The light is elevated 28 feet above the level of the sea.

Inner Light-vessel No. 2.

The inner Light-vessel, No. 2, lies with Bremer beacon, S. by W. ½ W., and the Jungfern beacon on Meyers Legde S.E. by E. ⅛ E.; the elevation of the light above the level of the sea is 29 feet.

The buoys outside No. 1 Light-vessel are placed in 6 to 9 fathoms, and those between the light-vessels in 6 to 7 fathoms.

Both light-vessels only leave their respective stations when obliged to do so on account of the ice. They are schooner-rigged, and carry the light, as also the ball, on their foremast, being the highest mast.

Directions for making the Weser.

1244. When circumstances permit, and particularly with southerly winds, vessels coming from the westward generally try for soundings on Borkum Reef, and then shape a course to the eastward, until being between Wangeroog and Helgoland, which islands, in the direction of N.N.E. and S.S.W., are distant 23 miles from each other. As mentioned in Art. 1227, with respect to the making of the Ems, Borkum Reef has remarkable soundings, and one to two fathoms less water than on either side of it; however, it is but of small extent E. and W.,

whereas it extends in a northerly direction about 30 miles from the outer shoals off Borkum; accordingly on approaching the reef the lead should be assiduously used. Along its west side, the soundings in the vicinity of the shallows from the shore are about 18 fathoms, the bottom of fine sand, mixed with black specks, but further off sleek and mud. From the reef, keep to the eastward in 13 to 14 fathoms, fine yellow sand with black specks, until abreast of Norderney, then keep in 11 to 12 fathoms, across Baltrum Flat, until getting sight of the lighthouse and church of Wangeroog, when you may shape a course for the Schlüssel buoy (Art. 1242), at the mouth of the Weser, in 10 to 11 fathoms, tough bottom. By night or in hazy or foggy weather, you should not stand nearer the shore than in 9 fathoms, on account of the before-mentioned shoals off Langeroog, which are steep-to, with 8 to 10 fathoms close to. Being in 7 to 8 fathoms, and getting sight of Wangeroog, the lighthouse should be brought to bear S.W.; then by steering N.E. during a flood-tide, and N.E. by E. during an ebb, you will most likely not miss the Schlüssel buoy at the mouth of the Weser.

Directions for making the Weser;

By night;

1245. If, after having sounded on Borkum reef, the intention be to make Helgoland, and from thence to take a departure for the Weser, you should steer E.S.E. or E. according to the depth you are in on the reef, from which the distance to that island is 60 miles, and as it may be seen far off, it is not easily missed. You should then approach the island within 4 miles, and steer S. by W., rather westerly or easterly, according as it is a flood or an ebb tide at the time; and this course will take you across the Norder Flat in 6 fathoms, just to the westward of the white buoy No. 1. Having sighted Wangeroog, you may shape a course for the outer buoys by attending to the bearings before given.

By sighting Helgoland.

From 14 and 13 fathoms off Helgoland the depth diminishes suddenly to 6 fathoms on the Norder Flat, but then it again increases to 11 and 12 fathoms, with tough bottom, between the black and the white outer buoys, consequently attention should be paid to the lead. In the vicinity of the black buoys in the Weser, the bottom is hard sand.

1246. Vessels may also, by passing Helgoland, enter the Norder Weser to the eastward of the Norder Flat, but it should only be attempted during settled weather. The depths in the track from

Norder Weser.

Helgoland to the outer buoy of the Weser are 23, 19, and 17 fathoms, sleek bottom, 16 and 14 fathoms, with fine grey sand with black specks, and then suddenly 5 to 6 fathoms on the Norder Flat: in the direction towards the Norder Weser you will find the same depths, until being distant about 8 miles N.N.E. of the light-vessel, where from 14 and 13 fathoms, you will suddenly get 4½ and 3 fathoms, but farther in the depth increases.

Tides. 1247. Between Helgoland and the mouth of the Weser the flood runs to the northward and eastward, and the ebb in the opposite direction: in the vicinity of the Weser and the Jahde, the flood stream sweeps S.S.W. across the shoals and up the river; the ebb runs in the contrary direction. At the outer light-vessel, No. 1, it is high water at full and change at 11h. 30m.

False Borkum Reef. 1248. During winter and boisterous weather from north and north-west, it frequently happens that vessels pass too far to the northward to get soundings to guide them off the shallows from the Dutch shore; if then, without an observation to ascertain the latitude, and after having been hove-to perhaps for several days, you are obliged to stand on to the eastward, this must be done with the greatest circumspection; for to the northward of the Helgoland Deep in 18 to 19 fathoms, you will get the same kind of soundings as those off the Dutch shore, and yet farther to the eastward, and about 20 miles to the northward of Helgoland, there are soundings like those on Borkum Reef. It must therefore be a general rule, in making Helgoland bay, rather to expose yourself to be caught on a lee shore on the coast of Holland, than to miss the remarkable soundings, which the shallows off the Dutch shore afford.

Signal for drift Ice. 1249. When the Weser is filled with drift ice, in such a manner that the entrance is doubtful, signal is made by one or two balls hoisted vertically on a stake on Wangeroog church steeple. One ball indicates that the entrance may be attempted, provided the wind is fair and the weather settled, and that a vessel, being off the outer buoy at the commencement of the flood tide, may have a chance to fetch Bremerhaven, if the wind be E. or N.E., or Fedderwarderhaven if the wind be from N.W. to W.S.W., owing to those winds forcing the ice either to the west or to the east side of the channel. If the wind happen to be scant, or it might be

deemed impossible to fetch one of these harbours, you must again stand out of the river, and never attempt to bring up either off Bremer beacon, or anywhere in the river. The signal is best distinguishable when the church steeple bears from S.S.E. to S.W. by S.

1250. Bremerhaven admits ships of any size; however, the locks are rather short for ships of a great length, particularly large steamers. This harbour, at the mouth of the rivulet the Geest, is pointed out at night by a harbour light. *Bremerhaven.* *Harbour Light.*

Only small craft not drawing above 3½ feet may proceed up the river to the town of Bremen.

INDEX.

	Page
Aabek Bay	300
Aaby Inlet	312
Aalbek Bay	32
—— Road	6
Aalborg Beacons	417
—— Harbour	45
Aale Head and Flat	282
Aalebierg Deep	116
Aarhuus Bay	61
—— Harbour and Light	63
Aarö Island and Shallows	292
—— Light	289
—— Sound	295
Aborre Bierg	200
Ackumer Ee	526
Adlers Ground	382
Æbelö Bay	270
Ægholm Island and Anchorage	290
Ager Island	366
Agerness Point	86
Agersö Sound	231
Agger Minde	394
—— Sound	414
Aitrup Bay	278
Albue Hills	438
—— Ledges	238
—— Road and Harbour	239
Alexandria	157
Alhagen Shoal	58
Alholm Island	108
Alleshauge Flat	90
Allinge	384
Almö Island	21
Alrö Sound	72
Als Deep and Harbour	119
—— Fiord	300
—— Island, E. and W. Channels	304
—— Reef	47
Alstrup Reef	258
—— Village	61
Alte Medem	502
Alten Garz	360
Altona Harbour	512
Amager Landmarks	164
Ameland Gat	521
Amrum Bank	443
—— Boat-harbour	447
—— Harbour	454
—— Island and Inlets	444–448
—— Light	457
Angeln Shallow	335
Anholt Anchorage	127
—— Island and Light	125
Ankiær Vig	274
Anslet Point and Flat	283
Apenrade Fiord	298
—— Port Charges	300
—— Slips	300
Appelvik Hill and Beacon	22
Arild Village	30
Arnager Bay and Reef	381
Arnis	338
Arnkiel Point and Harbour	301
As Bay and Head	72
—— Ness	204
Asaa Road	41
Askeground	137
Askim Fiord	17
Askö Island	250
—— Kirk Ground	250
Asnæs Point	105
Asness Beacon and Spit	287
—— Reef	286
Asperö Island	16
Asseler Sand	506
Assens Harbour and Light	258

	Page
Assens Road	288
Astal Island	10
Ätra Rivulet and Reefs	24, 25
Augustenborg Fiord	301
Aune Vig	284
Aunö Island	244
Aussen Brammer Shoal	505
Ave Sand	99
Avernakke Hage	251
—— Shoal, Nyborg Fiord	215, 216
Avernakö Island	312
—— Trille or Reef	307–314
Baagö Flat	290
—— Light	289
Baakholmen Rock	14
Baaklandet or Vinga Rock	13
Baaring Bay	272
Back Sand	451
Badstue Reef	212, 230
Baggen Rock	21
Bakke Ground	382
Bakken Shoal	390
Baliö Island	22
Ballum Inlet	441
Baltrum	526
Bandholm	248
Bangsbo Road	38
Barden Ground	293
Barling Sand	441
Barsebak Point and Reef	178
Barsö Island	296
Basnæs Harbour	235
Bastholm	294
Bätefiord	21
Bätstad Village and Anchorage	27
Battery Shoal	330
Baune Ground	141
Baursberg	511
Becker Loch	490
Beens Ley	469
Begtrup Bay	59
Belts, Entrance to the	83
Bergs Reef	23
Berre Knob	120
Bielke Flat	202
Biels Loch	490
Bikuben Hill	78
Billes Ground	317
Biörne Ground	238
Biörnen Shoal	179
Biörnö Island and Deep	308
Biörnsholm Bay	410
Biörnskunde Point and Ledge	73, 272
Birkholm Island	229
Bisserup Road and Spit	243
Blaabierg Anchorage	421
—— Hill	420
Blaakul Mountain	9
Blaavand Point	423
Blak Ground	381
—— Rock	54
Blang Point	248
Blankenese Sand	511
—— Village	512
Blauort Sand and Beacon	479
Blind Rön	405
Blöden Havn	45
Blokkenbierg Hill	394
Böcher Bank	113
—— Ground	203
Bockenis Point and Reef	338
Boel Reef	48
Boeslum Bay	55
Bögebierg	57
Bogense Road	271
—— Harbour	272
Bögeström Channel	195, 200, 268
Bögevig	232
Böigden Ferry	304
Bollerd Sand	435
Bolsaxen Rocks	89
Bolshavn Village	383
Bommen Port	162
Bondsiel Harbour	456
Bordelum Harbour	460
Borkum Bank	491
—— Light and Beacons	523
—— Reef, Soundings on	524
—— False	530
—— Road	525
Bornholm	379–385
—— Light	379, 384
—— Shoals	381
—— S.W. Coast	382
Borre Head and Reef	106
Borrebierg Reef	36
Borstel	512
Bösch Harbour and Light	504
—— Platt	521, 522
Bose Deep	221
Bösser Hage	334
Bötö Village and Nor	375
Bottö Light	12
Bourfeld Anchorage	111
—— Cay and Reef	110, 111
Bovberg Hill	418
—— Knob	423

	Page
Brændevin Spit.	117
Bragerne Shoals	390
Bram Aue	507
Bramnæs Rock.	14
Bramsnæs Bay	106
—— Creek	108
Brandaris Tower	519
Brandsö Island	283
Breckwolt Sand	510
Bred Ground (Sound)	176, 185
———— (Flensborg Fiord)	324
———— (Nysted)	367
Bredaberget Shoai	19
Brede Ground	261
Bredemand Ground	263
Bredhagen Shoal	45
Bredning, The, (Little Belt)	282
—— The, (Ise Fiord)	104
Bremen	531
Bremer Beacon.	528
Bremerhaven	531
Briseis Flat.	98
Brödet Point	297
Broen Flat	230
Broer Reef	383
Bröns Hill Light	438
Brouwers Plaat.	525
Brune Head	200
—— Reef and Beacon.	36
Brunehuus Harbour	305
Brunsbüttel.	503
Bruns Ness	328, 333
Buch Point	360
Bulbierg Bluff.	391
Bülk Light	341
Buoys and Beacons, Season for planting (Copenhagen Channels)	166
Buoys and Beacons, W. Coast of Jutland, Remarks on	426
Burg Tiefe	349
Burmester	512
Bursen Shoal	23
Buschsand Polln Beacon	479
Busholms Rocks	17
Buskär Light	12
—— Rock	14
Busse Rock	36
Büsum Harbour	483
Butt Loch	490
Butterlock	468
Bylykke Skaar.	77
Camperdown, or Kamperduin	516
Cancer Shoal	423
Carlsberg Hill	56
Chore Sand	435
—— Sand and Anchorage	471
Christiansö Beacons and Lights	387
—— Inlets to	386
Colberger Flat	341
—— Heide	343
Copenhagen Beacons and Buoys	165–167
—— Churches	164
—— Harbours	162, 163
—— Lights.	166
—— Quarantine Establishment	162, 163
—— Supplies	163
Cranz	512
Current, Elsinore	152
—— Hallands Wäderö	28
—— Kattegat	1
—— Jutland, E. Coast	3
—— Jutland, W. Coast	389
—— Læsö	3
—— Little Belt	274, 281, 290
—— Præstö Fiord.	199
—— near the Skagen	32
—— in the Sleeve, or Skagerak	3
—— The Sound	2, 134, 135
Cuxhaven Harbour and Light	499, 501
Dagebüll Harbour and Lights	469
Dalby Village	209
Dalsgaard	329
Dames Head	350
Dammen Harbour	110
Dana Fiord.	12
Danish Shore, Turning Marks (Sound)	147
—— Wohld	338
Danneskiold Shoal.	201
Dars Point and Light	362
Darum Inlet	434
David Bank.	384
Degelobet Anchorage	37
Degen Ferry	409
Deget Island	34, 35
Deierö Island and Flat	319
Diævle Boe.	79
Dicksand Gatt	489
—— Priel	485
Disken Bank	151, 153
Ditmarsch Ground.	475
Döde Anders Rock.	35
Dödemand Shoal	315
Dokkedal	46
Dömand Island.	33
Domsö Island	15
Domsten Reef	139
Dörjesk Island	10

	Page
Draaby Vig	407
Draget Deep	471
—— Inlet, Kattegat	10
———— W. Coast of Jutland	435
—— Liim Fiord	415
—— Knuds Head	244
Dragör Bridge	175
—— Light-vessel	175
—— Pillars	164
—— Harbour and Village	173
Dragstrup Vig	403
Dreiet Cove and Peninsula	289
Dreiö Flat	314
Drogden Bar and Channel, (Eider River)	474
—— Channel (Sound)	164, 171, 175
—— Light-vessel	166
Dronning Mill Anchorage	150
—— Shoal	201
Dronninge Dyssen Shoal	107
Due Sand	382
Dvale Ground	39, 40, 120, 121
Dybsö Island	244
Dynehöie Shoal	216
Dynen Rock	215, 216
—— Shoal (Liim Fiord)	416
Dyner Rocks	380
Dyngby Hage	65
Dyrborg Vig	310
Dyrefoi Holm	260
Dyrehöien Hills	55
Dyret Hill	64
Dyvek Bay	297
Dyveke Bay	252
East Bredning	412
Eastindia Shoal	141
East Reef (Anholt)	125
Ebelö, *see* Æbelö	270
Ebeltofte Bay and Harbour	58
Eckernförde Bay	338, 340
Eeg Havn	224
Eegholm Flat	233
Eenö Island	244
Eensten Rocks	263
Ege Head	61
Egelykke Reef	222
Egenæs Point	105
Egens Cove	60
Egense Deep	44
Egholm Anchorage, *see* Ægholm	290
—— Islands and Flat, Little Belt	320
Egholm (Liim Fiord)	416
Ehstersiel	477
Eider River	472–485
—— Alte, or Old	476
—— Directions for entering	473
—— Light-vessel	472
—— Lower, Buoys	478
—— Soundings off the	473, 480
—— Steam Tug	472
—— Upper	479
Eiderstedt and Fanö, Channels between	468–472
Eitzen Balge	501
Eken Sound	329, 333
—— Village	334
Elbe Anchorages	486, 500
—— Buoys	496
—— entering by day	497, 500
—— entering by night	499
—— Light and Pilot-vessels	495
—— Norder, or North, directions for	487
—— Precautions in entering	498
—— Regulations for Steam-vessels	511
—— Soundings off	493
—— South, Inlet	505
—— Tides at the entrance	494
Elbersbüttel Sands	484
Elephant Ground	208
Ellemandsbierg	58, 62
Elmshorn River	509
Elsholm Flat	298
Elsinore	151–156
—— Road, Anchorage north of	153
—— Appearance of coast above	156
—— Harbour and Light	154
—— Road	151, 153
Eltang Creek	278
Ems River	523–525
—— Directions for the	524
Endelave Anchorage and Ground	70
Enerhöi Island	238
—— Road	241
Engel Sand	457
Engelholm, or Skelder Bay	29
Engelschmaus Plaat	523
Englands Loch	468
Erö Island	317
Eröskiöbing	318
Ertholms, or Christiansö	385
Ertö Rock and Shoal	212
Este River	512
Faaborg Bay and Harbour	311
—— Fiord	307
Faareveile Road	105
Fæmö Island	255

	Page
Fænö Island	277, 279
—— Kalv	279
—— Tange, or Flat	279, 280
Færgeström, or Ferry Stream	265
Fævig	403
Fakkebierg Light, near S. point of Langeland	242
Falkenberg	23, 24
Falsche Tiefe	486, 488
False Bolsax	89
—— Kullen	27
Falsled Harbour	305
Falster Shore	263
—— Soundings on	375
Falsterbo Lights and Reef	187
Fanö Island and Channels	428–433
—— Anchorage	433
—— Harbour	431
—— Shoals, off south end	432
Farö Flat	262
Fartrap Deep	444, 445
Faurby Bight	196
Faxö Bay	193–202
—— Pier	194
Fedet Peninsula	194
—— Road	197
Fedhage Spit	194
Fegge Anchorage and Ferry	405, 408
—— Sound	404
Feiö Island and Marks	251
—— Channel	257
—— Middel and Kirke Grounds	250
Felskov Reef	193
Femern Belt	364
—— Sound	343–349
—— E. and W. entrance	347
Ferry Deep	262
Fialtring	418
Fiärskär Channel	13
Fiellebro Inlet	312
Fiellerup Flat	50
Finkenwarder Island	512
Fiolskär Rock	20
Fisker Deep	431
Flackström	485
Fladen Shoal	125, 130
Fladje Reef	179
Fladstrand N. Road	35
—— S. Road	37
Flæköie Shoals	281
Flag Deep, Wismar Bay	358
Flakstiert Sand	433, 435
Fleimose Sand	324
Flensborg Fiord	323
Flensborg Fiord Anchorages	332
—— Sailing and Turning Marks	331
—— Ground	83
—— Harbour	332
—— Pilots	335
Flenstofte	296
Fleske Ground	376
—— Reef	143
Fleskholm Cay and Flat	314
Flessing Shoal and Beacon	277–280
Fliemsdorf Point and Reef	357
Flint Channel	178–184
—— W. entrance	184
—— Ground	319
Flinthorn Reef	370
Flügge Sand	343
Flynder Ground	115
—— Spit	247
Fogelholm Rock	26
Fog Sand Spit	271
Föhr Island and Inlets	450
Föhrer Ley	470
Fönse Vig, or Bay	282
Fönskov Reef	280
Forness Anchorage and Light	51
Fotö Sound	12
Frank Cliff	229
Fredericia	275
Frederikshavn	7
—— Harbour and Light	37
Frederikssund Road	109
Frederiksværk Road	109
Freyburg Road	504
Friedrichsort Light	342
Friedrichstadt	479
Fuur Island	408
Fyen Head	88, 207
—— Shallows	296
—— S. Shore	306
Fyr Renden, or Lighthouse Channel	291
Gaabense Ferry	263
Gaase Ground, Bornholm	380
—— Sand	377
Gabels Flat	343
Gaddebo Reef	136
Galgebierg Hills	394
Gallie Deep	434
Galmsbüll Ley	470
Gals Cliff and Flat	277
Galtabak Rock	23
Galterö Head	14
Gamborg Fiord	280

	Page
Gänge Ley	470
Gategärd Sound	18
Gatskal	21
Gehlsand Channel	489
Gelting Bay	326
Gette Reef	158
Getterö Island	22
Giedser Reef Current	374
—— Light and Reef	371
—— Reef, Opening in	373, 374
Gienner Fiord	297
Gierild Bay and Flat	51
Gilleleie Anchorage	150
—— Flat	141–143
Giölhage	416
Giraa	41
Gislinge	106
Gisselöre Flat and Point	205
Glænö Shallow	243
Glomstrup Creek	402
Gluckstadt	508
—— Bank, or Rhin Plat	505
Gnetare Ground	140
Gniben Point	98
Goldt Harbour	346
Götha River	13
Götheborg	13
—— Inner Channel	10, 16
Gottenburg, or Götheborg	13
Graa Deep	428–430
Graen Road	9
Græsholm	294
Gräset, or Klofiord Harbour	19
Grassholm Island	33
Gravens Head	283
Gravensteen Point and Shoal	334
Great Belt	204
———— N. entrance	83
———— Termination of	269
—— Hou	222
Greenholm Island	320
Grenaa Harbour and Road	53
Grolle Ground	139
Grön Sound	264
———— E. entrance	376
———— Port Charges	378
Grönne Revle Shoal	100
—— Vold	348
Grossenbrode Shoal	344
Grove Flat	125
Grundebädan Shoal	18
Gryde Deep and Rocks	311
Gryde Ness Bank	274
Grydholm Bay	313
Grydholm Flat	314
Gryte-havn	29
Grytskär Rocks	29
Gudhiem	384
Gudnæs Head	403
Gudse Creek	278
Guldborg Sound	257, 258, 259
Gulderup Road	403
Gulstav Flat and Point	363
Gustaf Klint Flat	179
Gyldenlöve Flat	195
—— Head	386
Gylling Ness	71, 72
Gylten Rock	22
Haa Deep	43
Haak Grounds	516
Haalke Rock	14
Haber Ness	327
Hadding Reef	380
Haderslev Fiord	284
Hæktan Bar	9
Hættan Island	10
Haf Sand	436
Häfs Kulle	23
Hage Deep	415
Halk Head	295
Hallands Ås Mountains	23, 27, 28
—— Wäderö, or Wäder Island	28
Halleskär Shoal	13
Hallig, signification of	451
Halmstad Bay	23, 27
Hals	43
—— Dues and Signals at	44
Halsa Road	30
Halskov Head and Reef	210, 211
Hålsund Cape and Beacon	18
Hamburg Harbour	513
Hammer Point and Light	379, 384
Hamneboe Shoal	137
Han Revle	99
Handbierg	399
Hannibal Flat	354, 356
Hanstholm	391
—— Light	393
Harboöre	418
Harehiord Shoal	256
Harken Sand	367
Harle Passage	527
Harre Bay, or Vig	407
Hasê Rock	387
Haselö Narrows	259
Hasenöre Head	55
Hasle Harbour	385

	Page
Hästbäden Rock	15
Hastens Ground and Channel	97
Hatter Reef and Beacon	82
Hawke Road	14
Havground	216
Havknude Flat	53
Havmöllen	54
Havnmark Bay	205
Havrehest Reef	258
Hedeklint	311
Heilig Flat and Road	345
Heiligenhafen Inlet	345
Heiligenstädten Bay	507
Heilsminde	282
Helgenæs	58, 60
Helgoland	491, 492
—— Harbour	492
—— to Elbe, directions	493
Hellehavn Point and Reef	201
Helleholm Flat	232
—— Light	234
Helletofte Spit	222
Helmsand Steert	485
Helnæs Bay	304
—— Road	241
Helsingborg Harbour and Light	140
Helsingör Harbour	7
Helts Flat	326, 331
Henninge Harbour	228
Hense Bay	311
Hertan Rock	22
Hesbierg Ground	64
Hesnæs Vig, or Bay	376
Hesselö Island and Light	129
Heste Deep	377
Hestesko Road	198
—— Shoal, Faxö Bay	195
———— Little Belt	303
Heverknobs	448
Hever Ström, New, directions for	461
———— Anchorages	467
———— Old	457
———— Anchorages	461
Hevring Flat	50
Hiarbek Fiord	412
Hiarnö Flat and Sound	71
Hiellen Island and Shoals	36
Hielm Bight	202
—— Island	56
Hielmsö Island	259
Hierting Inlet	429
Highsands, Læsö	110
High Stones	314
Hindsholm	87
Hiörne Stone	370
Hiörnet Shoal	423
Hiortemose Ground	252
Hiortö Flat	314, 320
Hirtsholm Island and Light	33
—— Pilots at	38
Hittarp Reef	140
Hiulsand	255–259
Hobo Deep	430
Höganæs coal mines	30
—— Road	138
Höghalla Point	27
Hohe Weg Sand	528
Hohen Ground	346
Hohwacht Road	343
Höi Shoal	310
Hol Ness	328
Holbek Bay and Harbour	106, 107
Höle Bay	186
Holkenhavn Creek	215, 216
Hollænder Deep	164, 170
—— Ground	195, 248
Holm Rock	35
—— Shoal	272
—— Tange Hage	404
Holmbo Reef	111
Holme Stone	54
Holmer Fähre	468
Holmetunge Shoal	174
Holmhavn	34
Holser Reef	273
Holst Flat	296
Holstein Shore	342
Höminde Spit	364
Honsehals Sand	106
Hooge Anchorage	455
Horn Reefs	394, 422–425
———— (Outer) and Shoals	423
———— Tides	425
———— to the Southward	426
Hornbek Bay	151
Hornex Reef	111
Hornfisk Cay	117
Hörnum Deep	446
—— Point and Beacon	443
—— Swatch	444
Horsbüll Steert	470
Horse Cay	305
Horsens Fiord and Harbour	71
Hörup Hav	326
Hostrup Spit	299
Hou Sand	229
Houens Odde	278
Hov	42

	Page
Hov Havn	68
—— Rön Shoal	68
Hoxer Harbour	404
Höyer Inlet	442
Hugger Plaat and Inlet	489
Huleröd, or Hammar-house	151
Humlebek Harbour	157
Hunning Flat	441
Hurup Road	46
Husum Aue and Road	466
Hvalfisk Island and Beacon	357
Hvalp Sound	411
Hvedby Hage	263
Hveen Island	157, 159
Hvide, or Knud Kirke Reef	385
Hvide Ground, Nakskov Fiord	238
———— Nyborg Fiord	217
Hvidsteen Reef	33
Hygum	398
Hyllekrog	365
Ice, Kattegat	3, 4
—— Læsö	123
—— near the Skagen	32
—— Sound	156
Ilumö Island	305
Independence Rock	176
Indre Knæs	99
—— or Inner Reef (Siælland Point)	93
Infödsretten Wreck Buoy	170
Inholm Channel	13
Iörget Flat and Road	284
Ise Fiord	99–108
———— Anchorages	105
———— Entrance	100
Isse Head and Flat	74
Itzeho	507
Jahde River, Buoys in	527
—— Tides at the Entrance	494
Jakelberg Reef	354
Jammer Bay	392
Jammerland Bay	206
Jegen Flat and Point	111
—— Hills	110
Jegindtap Spit	400
Jensens Ground	318
Jernhatten Promontory	53
Jesse Point and Spit	411
Jessen Ground	54
Johns Ground	368
Johns Knoll	119
Jordsand Flat	441, 442
—— Ley	470
Juels Ground	190
Juels Sand	510
Juidsminde	73
Juist Island	526
—— Reef	525
Junge Jap Sand	451
Jungnæs Rocks	138
Jungs Head	268
Jutland, Currents off	3
——— Shallow	276
Jüvre Deep	435
Jyde Channel	163
Kaagesöre Channel	77
Kaakerholm Anchorage	10
Kaarsebölle Reef	222
Kaas Bredning	406
Kabbel Hage	397
Kaberne Beacons	42, 43
Kærnan Tower	136
Kalk Ground (Faxö Bay)	193
———— (Flensborg Fiord)	324
———— (Kattegat)	52
———— and Beacon (Sound)	181
Källarstene	28
Kallebo Strand or Inlet	190
Kallehave Ferry	267
Kallundborg Fiord	90, 205, 206
———— Harbour	206
Kälo Fiord	11
—— Island	64
—— Vig, or Bay	60
Kalven Rock and Beacon	11
Kalvesund	11
Kalvö Harbour, Gienner Fiord	298
—— Island and Reefs, Stor Ström	262
Kalvöre	304
Kamperduin or Camperdown	516
Känsö Harbour	15
Kapelhavn	29
Kappeln	338
Karby	403
Karet Rock	24
Karrebek Harbour and Road	243
Kartoffellock Channel	509
Kastrup Harbour and Pier	172
—— Knæ Shoal	171
Katingsiel	477
Kattegat, approach to	5, 6
———— Boundaries	1
———— Channels	7
Kattegat E. Channel	130
———— on the Navigation of	7
———— Winds	7
Kedholm Island	21

	Page
Keholm Harbour	17
Keke Ness Shallow and Light	324
Kellinghusen	507
Kesselhard Sand	358
Kidholmes	279
Kiel Bay	323, 364
—— Fiord	341
—— Harbour and Railroad	342
Kielderness Reef	248
Kielling Lo	472
Kielseng Shoal	329
Kiernemelk Harbour	263
Kierteminde Bay, Harbour, and Road	213
Kiestrup	403
Killebäcks Shoal	29
Kiöge Harbour and Light	192
—— Road	190
Kiölpen Island	34
Kirke Ground, Great Belt	245, 246
———— Læsö	118
———— Thunö	67
Kirkehavn	33
Kirkelöbet, or Church Channel, Ise Fiord	102
Kläback Rock	22
Klädsholm Harbour	9
Klæpen Reef	207
Klei Hole	367
Kleinekaap Beacons, Texel	516
Kleins Reef	128
Klepperne Shoals	74
Kleverberg Shallow	341
Klidderet Reef	144
Klinte Point and Shoal	99
Klintebierg	86
Klitmölle	394
Klofiord	19
Klokfoten Reef	19
Klokke Ground	55
Klör Grounds	56
Kloster Fiord and River	22
Klöverhage	214
———— Shallow	223
Klummer Reef	79
Klütz Head	353
Knæet Flat	117
Knähaken Reef	158
Knallen Shoal	115
Knarhöi Hill, or Jydske Aas	38
Knas Ground	307
Knas Channel	308
Knebel Bay	61
Kniep Sand and Deep	446
Knivsbierg Hill	297
Knob Point	126
—— Shoal, Horn Reefs	423
———— Kattegat	65
Knobe Ground	116
Knoll, Nysted	368
—— Reef	174
—— Sand	308
Knösen Shoal, Kattegat	70
———— Sound	184
Knud Kirke Reef	385
Knude Deep, Fanö	432
———— Great Belt	229
———— Little Belt	314
Knuds Head, (Kattegat)	51
———— (Nyborg Fiord)	214
———— (Little Belt)	298
———— (Siælland)	261
———— Reef (Siælland)	244
———— Ground (Little Belt)	283
Knudskov Reef	261
Ko Ground (Flint Channel)	184, 187
———— (Guldborg Sound)	257, 258
Kö Island	10
Kobber Deep	221
—— Ground	114
———— Knoll	124
—— Spit and Beacon	126
Koggebädan Shoal	18
Kolappe Channel	191
Koldby or Jordsand Ley	470
———— Kaase	75
Kolding Fiord	278
—— Harbour	279
Koller Sand	477
Kolsör Hage	69
Konemad Hage	254
—— Point	250
Konge Deep	164, 167, 168
Kongsbacka Fiord	20
Kongsbierg Hill	202
Kongsö Löbet	15
Kongsöre Point	105
König Christian Koeg	484
Koopen Flat	231
Korevlen	99
Korshavn (Fyen, N. Shore)	87, 88
———— (S. Shore)	312
———— (Kattegat, Swedish Shore)	24
———— Pass	314
Korsholm Bank	42
Korsör Harbour and Road	212
Korsöre Shoal	249
Kosten Anchorage	303
Koster Ferry	267

	Page
Kousholm Island	33
Kraase Bank	174
Kräboen Rock	10
Kracken Deep	358
Krage Ness	248
—— Puller	211
—— Sand	327
Krageskov Reef	32
Kragholm Island	216
Kråkas Rocks	9
Kraken Rock	22
Kramnisse Gap	364
Krieger Flat	202
Krik Bay	396
Krog Deep	370
Krogen Harbour	116
Kron Loch	485
Kronborg Castle	141
—— Light	144
—— Wreck Buoy	174
Krone Channel	162
Krückaue Inlet	509
Krumstiert Flat	346
Kugel Beacon	499
Kühlbrand Channel	513
Kulhus Channel	108
Kull Channel (Christiansö)	386
Kulla Gunnarstorp Rock	140
Kullan Rocks	178
Kullen Coast, S. of the	136
—— Light	30
—— Rock	10
Kummel Bank	113
Kyholm Boe Reef	79
—— Channel	76
—— Harbour	80
—— Island	75–81
—— Light	75
—— Sound	77, 81
Kykduin Fort and Light	516
Kysing Flat	64
Laaden Head	59
Laaen Deep	116
Laaland Shallows	236, 366
—— S. Shore	364
Laas Ground	312
Labö Sand	341
Ladegaard Reef	369
Lægg Bank	433, 434
Læsö Bank	124
—— Channel	38, 40, 120, 121
—— Currents off	3
—— Island	110
Læsö Light	39, 120
—— Shoals, east side of	114, 115
Laga Rivulet	27
Lahall Village	22
Laholm, or Halmstad Bay	26
Lambo Inlets	367
Lammefiord	105
Lammel Shoal	437
Land Deep or S. Inlet	440, 448
Landlöse Reef	210
Landskrona	158, 159
Lang Ground	303
Langballe Ground	78
Langballie Bank and Rivulet	328
Langeland, E. Shore	241
—— Shallow	222
Langeroog	526
Langholm Cay	110
Langö (Kattegat)	10
—— (Siælland)	267
—— Sand	228
Langöre Harbour and Inlets	80
Lappe Ground	143, 144, 148, 149
Lauenburg	513
Laurs Rock	36
Leghorn Sand	442
Lemdrup Rön	413
Lemkenhafen Harbour	346
Lemvig	397
Lenke Vig (N.W. Shore of Fyen)	280
—— (S. Shore of Fyen)	225
Lerberg	138
Lerche Harbour	205
Lerhamn	136
Lerkil Harbour	17
Lernacken Reef	181
Letten Flat	263, 266
Lifeboat and Rocket Stations	388
Light, Aarö Sound	289
—— Aarhuus	63
—— Amrum	457
—— Anholt	125, 126
—— Assens	289
—— Baagö	289
—— Borkum	523
—— Bornholm	379, 380, 384
—— Bottö	12
—— Bremerhaven	531
—— Bülk	341
—— Buskär	12
—— Christiansö	387
—— Copenhagen	166
—— Dars Point	362
—— Dragör	175

	Page
Lights, Drogden	166
—— Eckernförde	340
—— Eider River	472
—— Elbe	495, 510
—— Elsinore	154
—— Fakkebierg	242
—— Falsterbo	187
—— Forness	51
—— Fredericia	275
—— Friederichsort	342
—— Gluckstadt	508
—— Hals	43
—— Halskov Lygtebank	212
—— Hammer	384
—— Helgoland	491
—— Helleholm	234
—— Helsingborg	140
—— Hesselö	129
—— Kallundborg	206
—— Keke Ness	324
—— Kiöge	192
—— Knuds Head (Nyborg Fiord)	214
—— Korsör	212
—— Kronborg	144
—— Kullen	30
—— Kykduin	516
—— Læsö	39, 120
—— Lühe	510
—— Malmö	180
—— Marstrand	9
—— Möen	202
—— Morup Tånge	23
—— Nakke Head	141
—— Nidingen	19
—— Nieuwe Diep	519
—— Pelzer	351
—— Reef Ness	204
—— Rönne	380
—— Schulau	510
—— Seireö	91
—— Slipshavn	215
—— Spotsbierg	100
—— Sprogö	218
—— Stevns Cape	192
—— Stör	507
—— Sylt Island	437, 438
—— Terschelling	519
—— Thunö	67
—— Trave	352
—— Wangeroog	527
—— Warnemunde	361
—— Wyk	454
—— Værö	253
—— Vinga	12
Light, Vlieland	519
Lighthouse Channel	291
Liim Fiord	394–418
—— E. Entrance	42
—— W. Entrance	394
—— Tides, E. Entrance	44
—— W. Entrance	396
Liin Sand and Beacons	446
Lille Ground, Aarhuus Bay	61
—— (S. of Aarö, Little Belt)	286
—— (between Als and Fyen, Little Belt)	303, 308
—— (off Fyen Head, Great (Belt	88
—— (Sound)	176, 185
—— Hou	222
—— Kalvesund	11
—— Middel Ground	130, 131
—— Oles Bierg	419
—— Sö	368
Lilleholm, Kattegat	33
—— Great Belt	261
Lilleland Reef	19
Lilleö Island, Great Belt	250
—— Little Belt	319
Limhamn Beacon and Pier	180
Linderum Island and Flat	284, 293
Lindeskov Flat	230
Lindholm Channel, Kyholm	78, 83
—— Shoals	79
—— Island and Reef, Laaland	248, 254
—— Shoals, Nyborg Fiord	216
Linholm Island	11
Linnäs Village	22
Lippe Point	343
Lips Deep	359
—— Flat	353
List Lights	437
Lister Deep	437–441
—— by Night	440
—— from the S.	439
Listerley	442
Little Belt, Limits	270
—— Narrows	274
—— Termination of	323
Liv Tap or Spit	409
Livö Island	405, 409
Lögstör Bar and Harbour	413, 414
—— Bredning	405
Lohals	229
Löibierg Hill	391
Lökholmar Island	15
Lomma Bay	178
Long Reach	45

	Page
Löngs Point	276
Lönnerup Fiord	404
Löse Flat	65
Lous Flat	157
Lübeck	353
Lühe Light Vessel	510
—— River	512
Lundåkra Bay	178
Lunderberg Sand and Beacons	465
Luus Ground	141
Luushage Flat	58
Lybecka Reef	25
Lyeness Sand	99
Lygte Anchorage	60
—— Puller or Sand	212
Lykkehöi Hill	308
Lyngens Haven	24
Lyngholm Point and Ferry	105
Lyö Flat and Sand	306, 307
—— Sound	313
Lyse Ground	128, 208
Maderne Island	195
Madsen Ground and Beacon	325
Madses Cliff	203
Mæsholm	338
Maglebylille Hage	172
Magnarp Village	29
Main Deep, Little Belt	285
———— Wismar Bay	355
Malmö Road, Harbour and Light	180
Malö Sound	18
Malt Rock	36
Maltgœrn Rock	383
Mande Head	193
Manö Gyde	471
—— Island and Shoals	435
Marens Reef	36
Margareten, St., Harbour	505
Mariager Fiord	47
Maribo	249
Marien Leuchte	349
Marienlyst House	266
———— Palace	141
Markeldorf Flat	350
Mars Wreck Buoy	170
Marschnak Shoal	452
Marsillisborg Road	63
Marstal	321
—— Bay	363
Marsten Rock	26
Marstrand Fiord	8
———— Harbour	10
Marthe Flat	82, 83
Masnedö Flat	265
—— Island	262
Matskär Rock and Beacon	16
Mecklenburg Coast, Shallows off the	361
Meelsted Anchorage	383
Meldorf Harbour	484
Mellem Reef, Kattegat, Swedish Shore	24
———— Siælland	95
—— Flat	116
—— Löbet	191
Mellerup	49
Mett Ground	367
Meyer Ground, Laaland	259
———— Langeland	229
Meyers Sand	432
Middel Flat, Aarhuus Bay	61
———— Anholt	125
———— Kyholm	82
———— Flensborg Fiord	330, 331
—— Ground, Aarhuus Bay	61
———— E. Channel of Kattegat	130-132
———— Æbelö	85
———— Faxö Bay	195
———— Femern Sound	348
———— Grön Sound	376
———— Ise Fiord	99
———— Læsö Channel	39, 40
———— Raagö Sound	247
———— Sound	163, 169
———— Taasing Island	226
Middel Punten	167
Middelfart	277
Middle Deep, Wismar Bay	356
—— Flat, Eckernforde Bay	338
—— Ground, Helnæs Bay	304
———— Liim Fiord	415
Miele Fluss or River	483
Mittel Ground	354
—— Plaat	481
Möen Cliffs	200
—— Deep	378
—— Light	202
Mogholm Island	33
Mölle Bay	274, 276
—— Ground, Endelave Island	70
———— Flensborg Fiord	329
———— Great Belt	213
———— Sound	137
—— Reef	35
Mölleleie	136
Mols Land Anchorage	59
Mönster Sound	19
Moordick	468

	Page
Mörke Deep	229, 319
Mörkholt Reef	273
Morup Tånge and Light	23, 24
Mos Vig or Bay	282
Mose Ground	315
Mosede Rock	189
Mosel Ground	57, 82
Muldbierg Shoal	46
Mulen	90
Mummark	317
Munke Grounds	82, 83
—— Point	330
Muusholm Bay and Island	209
Naamandsreef	33
Nakke Head Lights	141
—— Point	102, 104
Nakskov Fiord	238-241
Napstiert	32
Nardhaken Shallow	159
Näskrok	21
Naveren Reef	52
Navers Ground	227
Næs Sound and Ferry	400
Næsbek	365
Næsby Reef	106
Nebbe Revle or Shelves	241
Ness Point	23
Neufeld Harbour	503
Neumühlen	512
Neustadt Bay	350-353
—— Harbour	352
New Deep, Grön Sound	377
—— Nau Channel	465
—— Schmal Deep	447-454
—————— Anchorages	454
Newerk Lights and Beacons	494
Nexelö Island and Bay	91
Nexö Road and Harbour	383
Nib Inlet	434
Nibe Bredning and Road	416
Nidingen Rock and Lights	19
Niendorf Flat	352
Nieuwe Diep Lights	519
Nissum Bredning	396
—— Fiord	419
Nivaa Flat	157
Nord Skars	137
Nordby	431
Norder, or North Aue	452, 453
—— Gat, Elbe	496
—— Piep, Eider	479, 432
Norderney	526
Norderoog Hallig	451
Nordhafen	460
Nordhövt Harbour	466
Nordmand Flat	194
Nordmands or Sluge Deep	425
—————— Sand	259
Nordstö Anchorage	21
Noret Bay	227
Normanshagen Shoal	42
Nörre Deep	417
—— Sundby	46
Nörreby Rende and Village	85
Norsminde Harbour and Flat	63, 64
North Bierg	127
—— Flint Shoal	179
—— Gat, Texel	518
—— Köies Point and Reef	279
—— Rack (Eider)	475
—— Rönner and Cays	110, 111
—— Röse Shoal	171
—— Seal Ground	228
Northwest Reef (Anholt)	127
—————— and Beacon (Læsö)	119, 120
—————— (Tyvholm Island)	33
Nübel Nor	334
Ny Anchorage	407
—— Kirke Reef	385
Nyborg Fiord	214-218
—— Pier	218
—— Quarantine at	218
Nyhamn	136
Nykiöbing	259
—— Bay	104
—— (Liim Fiord)	406
Nykirke Shoal	331
Nyminde Gab	419, 420
Nyord (Möen)	269
—— Island (Faxö Bay)	199
Nyrup Bay	99
Nysted, directions for	367-369
—— Shoals	367
Öckerö Sound	11, 18
Odde Sound	398
Odense Fiord	86
Oehehav Bank	335
Oevelgönne	512
Oggeldai Skaar	76
Ohlenburg, or Marien Light	349
Ohnse Vig	236
Oieness Sound	280
Old Schmal Deep	456
Omö Flat and Sound	233
—— Tofte	234
Oos Passage	11

Page

Orby Flat 284
Ordrup Ness and Reef. 91
Öre Flat. 55, 57
—— Sund 133
Öretvisten Gully 145
Öring Shoal 381
Ormö Island 243
Orth Road Harbour 346
Oste Bank and Riff 504
—— River 502
Öster Ems 525
—— Head 250
——Ley 470
Österild Fiord 404
Osterman Loch 479, 490
Östre Mærker, or Eastern Marks. 366, 369
Oure Flat 223
—— Head 318
———— Flat. 260
Oureby 249
Ourö Island, Reefs, and Channels . 106
Outer Knob, Giedser Reef . . . 373
Oxen Islands and Harbour . . . 330
—— Sand 459

Päarps Reef and Rocks 27
Pagen Sand. 506
Pakhuus Bay 127
Pale Grounds 217, 223
Paludan Flat 89
Pander Deep 443
Päregaar 223
Pasberget Rock 20
Paternoster Rocks 9
Patten Anchorage 10
Peelrevel Sand 433
Pelworm Harbour 459
—— Inlet 467
—— Island and Tower 449
Pelzer Light 351
—— Point 350
Pender Sand 434
Peter Carstens Loch 475
—— St., Beacon 473
Petten Shoal 516
Pilots, Aarhuus. 63
—— Aaarö 293
—— Bandholm. 249
—— Bogense 272
—— Bornholm. 380
—— Christiansö 386
—— Dyrborg 310
—— Ebeltofte 59
—— Eckernförde 641

Page

Pilots, Eider River. 472
—— Elsinore 154
—— Endelave 69
—— Feiö 254
—— Fiellebro 312
—— Flensborg. 335
—— Fredericia 275
—— Giedser 372
—— Heiligenhafen 345
—— Hirtsholms 38
—— Höganaes 138
—— Horsens 72
—— Hurup 47
—— Ise Fiord 101, 107
—— Kallundborg 206
—— Karrebek 243
—— Kiel Fiord 342
—— Kierteminde 213
—— Kirkhavn 101
—— Korsör 213
—— Kyholm 75
—— Læsö 122
—— Liim Fiord 44, 395, 396
—— Malmö 180
—— Marstal 322
—— Masnedö 265
—— Nakskov 241
—— Neustadt 351
—— Nyborg 218
—— Nykiöbing 260
—— Nyminde Gab 421
—— Nyord. 199, 269
—— Odense 86
—— Osterby 252
—— Rönneklint 199
—— Rörvig 101
—— Siælland Point 93
—— Skagen 32
—— Skanör 187
—— Skielskör Fiord 231
—— Sli Fiord 336
—— Sönderborg 303, 335
—— Sound 134
—— Tærö 266
—— Terschelling 520
—— Texel 516
—— Thisted 402
—— Thunö. 67
—— Tislarn 16
—— Travemünde 353
—— Veile Fiord 274
—— Vlieland 520
—— Vordingborg 266
—— Warberg 22

	Page
Pilots, Warnemünde	361
—— Weser	527
Pikerholm Island	33
Pilhaken Shoal	158
Pilken Anchorage	59
Pinhätten Knoll	178
Pinnau Rivulet	509
Plade Shoal and Beacon	354
Pladen Shoal	268
Plantagenet Shoal	362
Poel Beacons	355
—— Bro	323
—— Channel	360
—— Reef and Beacon	323
—— Sound	358
—— Spit	306
Poller Grounds	367
———— Passage	370
Pomle Head	376
Pomlereude Stream	201
Pölsern Rocks	10
Pouls Knob	467
Poulsen Reef	35
Præstebierg Reef	376
Præstö Fiord	199
—— Inlet	196
Presen Bight	350
Prince Frederik Ground	273
Prövesteen Batteries	166, 167
Puller Reef	53
—— Rock (Kallundborg Fiord)	90, 204
—— Rocks (Great Belt)	211
Pulse Vig	408
Purren Ström	476
Puttgarden Reef	349
Quartus Shoal	175
Quisnæs Point and Flat	327
Qvols Hage and Sandbank	412
Raa Village and Flat	158
Raad Head and Reef	295
Raagö Island	246
—— Kalv Island	246
—— Nebbe Ground	252
—— Sound	247
Rammen Island and Anchorage	10
Ramnö Rös	20
Randers Fiord	48
Rasmus Rock	172
Raven Reef	10
Ravnen Rock	172
Ravneungerne Flat	172
Ravnholt Hage	247
Ravö Anchorage	15
Reef Ness	90, 204
———— Light	84
Reersö Peninsula and Rock	207
Refuge Ports (Kattegat)	8
Reisby Shallow	436
Rem Shoal	286
Renden Channel	163
Rendsborg	478, 479
Reuter Deep	448
Revbierg Ground	226
Revkrog Anchorage (Great Belt)	211
—— Bay (Little Belt)	312
———— (Ærö Island)	317
Revlers Shelves	377
Revshale Point and Shoal	295
Revshalen Reef	162, 168
Rhin Plat	505
Riesen Sand	485
Rifö Fiord	12
Rigsbank dollar, value	44
Riisgard Bredning	410
Rimmen Shoal	41
Ringebierg Hill	424
—— Sands	69, 74
Ringhals Point	21
Ringkiobing Deep	423, 424
———— Fiord	421
Rinkenis Bay	329, 333
Ripplings, Kattegat	2
Rising Head Patches	214
Rist Ground	437
Ristinge Anchorage	228
Robsand Grounds	442
Rockel Ley	470
Rockets and Life-boat stations	388
Röd Ground (Great Belt)	221, 222
———— (W. coast of Jutland)	390
—— Sand	365
Rod Ness Flat	249
Rödby Inlet and Pier	365
Röde Bank, Kattegat	132
—— Bay, Mecklenburg	360
—— Cliff, Sylt Island	438
—— Deep	444
Rödeklif Sand	436
Rödkilde Vig	312
Rödlok Ground	312
Rödskär (Red Rock)	23
Rödsteen Reef	367
Rödsten Rock	172
Rödvig	193
Roeskilde Fiord	108
Rög Deep, or N. Inlet	439

	Page
Roholm Island	86
Romö Deep and Harbour	441
—— Island	436
—— Ley	471
Romsö Island	207
Rön Islet (Liim Fiord)	405
—— Reef (Liim Fiord)	397
—— Rock (Swedish Shore, Kattegat)	17
—— Shoal (Great Belt)	244
Rongholt Sand	459
Rongsted	157
Rönne Bank and Harbour	379
—— Reef and Road	379
—— Lights	380
Rönneklint	194, 196
Rönnen Ledge (Ise Fiord)	104
—— (Thunö)	66
—— (Begtrup Bay)	60
—— Shoal (Sialland Reef)	96
Rorö Island and Harbour	10
Rörvig Road	102
Rosengard Reef	25
Rosenvold Bay and Flat	273, 274
Rosera Rock	17
Roshage Point	394
Rostok	361
Rothe Ground (Kattegat)	53
—— Rock (Sound)	181
Rubierg	391
Rudkiöbing	225
—— Harbour	227
Rue Vig	403
Rugaard	53
Ruggen Shoal	162, 170
Rummelhafen	513
Rusmand Shoal	114
Rusteen Reef	109
Ruthen Pass	506
Ryes Flat	62
Rygas Shoal	21
Ryggen Shoal (Fyen)	208
—— —— (Nakskov Fiord)	238
—— —— (Nyborg Fiord)	216
Rytterknegt Hill	379
Sæby Town and Flat	38
Sæl Reef	36, 256
Sælo, or Schmidts Ground	268
Sælvig, Samsö	74
Sætterierne Anchorages	109
Sætterriet Road	100
Sagas Flat	350
Salling Head	326
—— Sound and Ferry	407
Saltbæk Bay	90
Salthammar Point and Shoal	158
Salthammer Reef	383
Saltholm Flat	173
—— Ground	170
—— Island	178
Saltvik Bay	178
Salz Haff	360
Samsö Bay	74
—— Channel	69
—— Island	73–75
Sandager Point	329
Sandbierg Bay	73
Sanden Flat	124
Sandene, or the Sands (Faxö Bay)	194
—— Flat (Kyholm)	78
—— Passage (Faxö Bay)	199
Sandhagen Point	38
Sandhammer Shoal	291
Sandhavns Creek	26
Sandinsel Beacons	491
Sandloch Inlet	477
Sandö Sound	18
Sandort Reef	504
Sandshörn Pass	468
Sandvig (Bornholm)	384
—— Bay (Little Belt)	295
Sarö Island	16, 17
Savesborg Ridge	207
Saxkiöbing Fiord	249
Schaape Sand	525
Scharhorn Sand and Beacon	494, 500
Schiermonnikoog	522
Schlütt Channel	469
Schmal Deep, New	447-454
—— Old	456, 457
Schmidts Ground	268
Schönheider Flat (Aarö)	296
—— Shoal (Laaland)	366
Schulau Light Vessel	510
Schulpe Gat	517
Schülpersiel	478
Schultz Channel	97
—— Ground	97
Schwampelhörn Sand	475
Schweinsköthel Shoal	355
Schwentine River	342
Seal Ground	228
—— Reef	256
Sebber Sound	417
Secher Ground	355
See Sand and Beacon	449
Seglflod	45
Seibierg Ridge	277

	Page
Seierbo Pass	93
Seierö Anchorages and Bay	93
—— Point and Light	84, 91
—— Reefs	92
Selle Stone	381
Seventeen Feet Patch, Rodby	366
Shipping Places, W. C. of Jutland	391
Siælland, E. Shore	189
—— Point and Reef	93
—— Reef, Anchorages off	96
——— Channels	94–96
Silde Rön and Beacon	117
Sillesund	10
Simons Rock	36
—— Sand	522
Simonsberg Loch	468
Siö Sound and Shoals	227
Siöllen Shoal	179
Skaane Holm	260
Skaaning Reef	387
Skaarö Reef	312, 313
Skaarupöer Sound	223
Skab Reef	159
Skade Ground	57
Skælfiske Ground	315
Skagen or Scaw, Beacon and Light	31
Skagerak. *See* Sleeve.	
Skala Harbour	19
Skalbak Shoal	253
Skalklippen Rock	22
Skallen Point and Anchorage	26
Skalö Island	251
Skalör Rock	181
Skandse Channel, Ise Fiord	104
Skanör Peninsula	187
Skarileya Rock	9
Skars Rocks	137
Skattebölle Reef	222
Skaverup Village	244
Skelder Vik or Bay	27, 28, 29
Skiær Reef	299
Skibsted Deep	266
—— Fiord	402
Skidenkind Flat	329
Skielhöien	56
Skielle, or Seal Reef	256
Skielskör Fiord and Road	231
Skierbek Spit	50
Skierebek Reef	99
Skilling, value of	44
Skinfel Rock	270
Skinkelmær Sand	106
Skinsæk Bay	42
Skiöds Head	60
Skiold Ness	317
Skiollen Shoal	116
Skippar-kroken	30
Skipper Ground	262, 266
Skive Fiord	411
Skö Ground	250
Skomager Ground	71
Skopp Shoal	257
Skotta Reef	24
Skov Sand	249
Skrædder Holm Shoal	191
Skrams Flats	313
Skriverklippen Anchorage	22
Skrollen Shoal	365
Skudders, or Smacks	389
Skude Channel	161
Sleeve, or Skagerak Currents	3
——— Soundings in	390
Slesvig Holstein Canal	342, 472
Slette Reef	251
Sletterhage Anchorage	58
Sletting Flat	210
Sli Fiord, directions for	336
—— River	337
—— Sand	335
Slimünde	335–337
Slips Havn	215
Slipsminde	296
Slots Ground	217
Slotsgavlen Shoal	201
Sluge Channel	423, 424
Smaa Ground	174
Smaaholms	294
Smaalands Hage	401
Smidstrup Ground	141
Smöget Channel, Ise Fiord	102
Smör Sand	429
Smörstacken Hill	23
Smörstak Channel	222, 227
—— Island and Ledge	221
Snark Rock	386
Snaverön Rock	207
Sneedorf Flat	363
Snekke Channel, Siælland Reef	94
—— Ground	363
Snekkeö Rocks	266
Snöde Reef	222
Snogbek Spit	300
Snoghöi Ferry	277
Sö Ground	68
Söborg Reef and Beacon	143
Söby Bay (Ærö)	317
—— Hage and Reef (Kattegat)	67, 68
Sodse Gap	264

	Page
Sodse Point	263
Söhunde Bay	200
Solt Sand	437
—— Deep	439
Sönakke Point	190
Sönder Ground	71
Sönderballe Head and Spit	297
Sönderborg Harbour	302
Sonderhö Road and Beacons	432, 433
Söraa Road	41
Sörenholm Reef	81
Sorte Hat Reef	385
—— Rende	191
South Bierg	128
—— Flint Ridge	182
—— Kóies Point and Flat	280
—— Rack, Eider River	475
—— Rönner Flat and Beacon	118
—— Röse Ledge	173
—— Seal ground	228
Sound, the, N. Entrance, Directions for	136, 141, 149
—— N. Entrance at night	149
—— S. Entrance	188
—— Soundings	188
—— Turning marks	148, 149
—— W. Channel	160
Soundings, Swedish shore of Kattegat	5
Southwest Deep	434
Spanbanken Bank	13
Speider Reef	36
Spiirholm Cay and Beacon	110, 111
Spikeroog	526
Spodsbierg	242
Spotsbierg Point and Light	99, 100
Sprogö Island, Light and Reef	218
Staal Grounds	235, 252
—— Deep	254
Staber Huk	344, 349
Stade	510
Staffan Flat	159
Stauns Head Spit	50
Staver Head	207, 213
Stecknitz Canal	513
Steen Ground and Beacon	182
Steenack Deep	446
Steenbotten Rocks	137
Steenhöi Reef	216
Steenkarlen Beacon	66
Steenkars Shoal	267
Steenknud Shoal	116
Steenö Reef	263
Steenöre Nakke Reef	256
Steenrön, Als Island	303
Steenrön Grön Sound	376
Steenröse Reef	196
Steenskars Rocks	139
Steensöre Shoal	127
Stege	269
Stegvig Bay	300
Stein Rock	491
Stemme Tofte Shoal	255
Stenderup Flat	280
Stensiö Haven	26
Stevelt	285
Stevns Cape	192
Stierne Ground	334
Stis Ness	232
—— Shallow	236
Stoense Harbour	222
Stokkebek Flat	223
Stold Flat	91
Stoller Ground	339, 341
Stopping places, W. C. of Jutland	392
Stör River and Light	506
—— Ström	261, 264
Store Gab	381
—— Holm (Great Belt)	261
—— (Kattegat)	33
—— Kalvesund	11
—— Middel Ground	132
—— Sand	99
—— Vroy	90
Storkhals Sandbank	415
Störort	507
Strand Channel	469
Strandby Reef	34
Strande-gaard Road	196
Striib Reef and Point	276
Struer	398
Strukamp Shoal	344
Strynö Island and Flat	228
Stubbekiöbing	263
Stubben Bank	161
Stubs Boe	80
Styrsö Island	15
Süder, or South Aue	455
—— Piep (Eider River)	479, 480, 481
Suderdick Loch	456
Suderö Flat	257, 258
Sundby Ferry (Kattegat)	46
—— Hage (Sound)	168, 169, 171
Sundevit Spit	302
Sundsör Hage	410
Sunningarne	9
Svælget, Liim Fiord	414
Svale Hills	394
Svalerumpen Shoal	169, 171

	Page
Svane Ground	69, 70
Svanen Inlet	10
Svanevig Bay	248
Svanhals Point	29
Svanike	383
Svanklapperne Cays	178, 181
Svartskär (Black Rock)	17, 23
Svelmö Island	311
Svendborg Sound	315
—— Current and Tides	316
—— E. Channel	224
Svenske Holm Shoal	191
Svineboen Rocks and Beacon	139
Svinö Island	244
Svitringen Shoals	41
Swedish Shore, Soundings and Turning Marks	145
Sylt Island and Lights	437
—— Island, W. side	443
Syr Point	112
Syvsighage Shallow	295
Taarbek Flat	160
Taarn Channel	387
Taars Bay	255
—— Road	238
Taasing Ground	228
Tællemand Shoal	114
Tærö Island	262
Taksen Sand	304
Tamdrup Hill	285
Tangen Bank	50
Tannis Bay	392
Tarnewitz Point	353
Terschelling Harbour and Tides	521
—— Light	519
Terskelen Bank	99
—— Channel	102
Teten Shoal	241
Tetenbüll Inlet	465
Teufelsbrücke	511
Texel Stroom	515
—— Making the	517
—— Road	518
—— Time-ball and Steam-tug	519
—— Soundings off	520
That Islet	387
Thisted Bredning	403
—— Directions for	399
—— Harbour	402
Thorö Bank	296
—— Bund	225
—— Island and Reefs	224, 286, 289
—— Sound	289
Thorsminde Fiord	419
Three-rock Channel	191
Thunö Island and Light	66, 67
Thynebierg Stone	92
Tiæreby Creek	210
Tide Table, W. C. Denmark	514
Tides, Cuxhaven	501
—— between the Ems and the Jahde	525
—— —— Helgoland and the Weser	530
—— Horn Reefs	425
—— to the Elbe	427
—— Ise Fiord	99
—— Jutland, W. C.	389
—— Kyholm	80
—— Læsö	122
—— Liim Fiord	44
—— Lister Deep	440
—— Nykiöbing	260
—— Slimünde	336
—— The Sound	135
—— Thorsminde Fiord	419
—— Weser River	530
Tidsel Ground	367
Tilö Harbour	21
Tislarn Rocks	16
Tolk Deep	378
—— Grounds	376
Tolken Shoal (Ise Fiord)	99, 102
—— (Sound)	187
Tönneberg Bank	113
Tonnen Sand	506
Tonnenhacken Reef	354
Tonnes Reef	281
Tönning Harbour	476
Torborskär Rock and Beacon	11
Toreko	28, 29
Tornbakke Hill	394
Törre Ground	249, 250
Tose Shoal, or Taasing Ground	228
Tosse Ground	250
Trabeens Hage	299
Trælle Ground	266
Træsko Flat	273
Trane Sand	303
Tranebraka Rock	17
Trangmand Sandbank	412
Trave River and Light	352
Travemünde	353
Tre Kroner Light	166
—— Steens Reef	36
Treaa Anchorage	50
Trelde Ness	273
Trind Channel and Sand	101
Trindel Sand and Spit (Elbe)	488

	Page
Trindel Shoal (Bornholm)	380
——— (Flint Channel)	181
——— (Giedser Reefs)	372
—— Spit (Als Island)	326
Trindelen Channel (Kattegat)	114
—— Shoal, Beacon, and Light	112
Trinnegrund	139
Troense	225
Troldslykke	280
Trolles Ground	360
Tudse Hage	231
Tungen Spit	216
Tusch Grounds	450
Tvillingen (The Twin)	141
Twielenfleth	510
Twin, The	141
Tybring Vig, or Bay	282
Tylen Rock	26
Tylö Ground	26
Tyvholm Island	33
Udby	48, 49
Uddewalla	9
Udsagers Hage	75
Ugga Beacon	24
Ulf Sound, from the West	267
Ulfshale Channel	200
—— Peninsula	195
Ulmevik	21
Ulv Spit	423
Ulvegab Channel	417
Utersen	509
Vaarsaa	41
Værirö Island and Light	253
Værö Sound	83
Vagrien District	343
Val Ground	158
Valkyrien Knob	351
Valle Ground	253
Vanguard Rock	16
Varder Holm	345
Vargaard Head	282
Vargö Hule	15
Varholm Rock	17
—— Sound	12
Variation between Horn Ness and the Elbe	428
Varnitz Head	299
Varö Græsset Road	15
Varö Island and Beacon	17
Varren Harbour	19
Vasebro Pier	231
Vedbek	157
Vedelsborg Head	282
—— Pier	287
Vei Deep	43
Veile Fiord	73, 272-274
—— Town	274
Vemmenæs Peninsula	225
Vemmetofte	194
Vene Grounds	245
Vengeance Shoal	230
Venning Bond Bay	326
Venö Sound and Bay	398
Vensholm Island and Sound	237
Vester Flat	158
—— Hog Bank	390
—— Ley	470
—— Ness Shallow	241
—— Vandet Lake	394
Vesterland Ground	142
Vesterskov Flat	257
Vestre Mærker, or Western Marks	366, 368
Viborg	412
Victoria Rock	24
Viften Beacon	48
Vigsö Bay	393
Vil Sound and Ferry	401, 403
Villingebek Flats	144
Vinbergholm Harbour	17
Vinga Rock, Beacon, and Light	12, 14
—— Sound	12, 14
Viö Island	305
Virk Sound	412, 41
Virkesholm Anchorage	18
Visby Bredning	401
Viskiar Rock	14
Viten Rocks	16, 21
Vitten Ground	366
Vix Ness	255
Vixö Skal	255, 259
Vlie Stroom	519
Vlieland Light	519
—— Shoals off	520
Vogelsand	500
Vordingborg Road	266
Vorre Knude	315
Vrangö Island	15
——— Road	17
Vresen Island	221
—— Patches	219
—— Pullen	220
Vriesche Gat	522
Wäderö Island	28
Wangeroog Island and Light	527
Warberg Castle and Harbour	22
Warnemünde Harbour and Light	360

	Page
Warnow River	360
Warverort Harbour	484
Wedel	512
Weissenhaus Flat	343
Wendelsö Island and Anchorage	21
Werder Island	360
Weser River	527–531
—— Directions for	528
—— Light-vessels	528
—— Pilots	527
—— Signal for drift ice	530
—— Tides off the entrance	494
Weslingburen Loch	490
West Gat, Texel	518
—— Haken Shoal	184
Westbrandung Shallows	443
Wester Ems	523
Wewelsfleth	507, 508
Wiby Point	29
Wichter Dybet	526
Wiken Village	139
Wingaskär Beacon	28
Wischendorf Spit	357
Wismar Bay	353–359
—— Beacons and Buoys	355
—— Harbour and Road	358
Wittenberg	512
Wohlenberg Bay	357, 359
Wohrden Harbour	484
Wolf Sand	506
Wollerwick Road	475
Wrenen Rock and Beacon	28
Wringle Lo	472
Wrist, Shipping place	507
Wulffs Flat	62
Wustrow Flat	354
Wyk Harbour and Lights	453
Yder Reef (Siælland Point)	95
Ydre Knæs	99
Yholm Island	315
Zirow Bight	357
Zuider Zee	515

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY.

LONDON: PRINTED BY W. CLOWES AND SONS, STAMFORD STREET,
FOR HER MAJESTY'S STATIONERY OFFICE.

00104709

Digitized with financial assistance from the
Government of Maharashtra
on 05 October, 2018